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Green et al.

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(54) **ROLL-ON, FOLDABLE LITTER AND PATIENT HANDLING SYSTEM FOR EMERGENCY TRANSPORT VEHICLES**

(75) Inventors: **Lowell A. Green**, Littleton, CO (US); **Ryan N. Mecklem**, Parker, CO (US); **Tyler Frederick LeMarinel**, Denver, CO (US)

(73) Assignee: **Air Methods Corporation**, Englewood, CO (US)

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(51) **Int. Cl.**
A61G 1/02 (2006.01)

(52) **U.S. Cl.** **296/20**

(58) **Field of Classification Search** 296/20; 5/11

See application file for complete search history.

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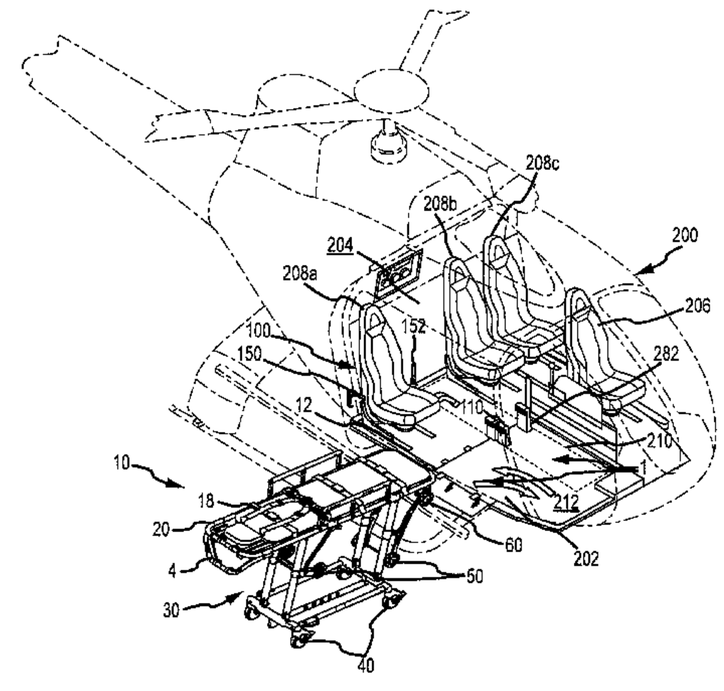
Primary Examiner — Lori Lyjak

(74) *Attorney, Agent, or Firm* — Marsh Fischmann & Breyfogle LLP

(57) **ABSTRACT**

A patient transport litter and system includes a patient support platform interconnected to a foldable frame that may be supported by and rolled upon a first plurality of wheels in an unfolded state. In a folded state, a second plurality of wheels may be provided to support and allow for rollable movement of the patient transport litter. A leading plurality of wheels may be provided at one end of the patient support platform for initially and rolling upon engaging the floor of an emergency transport vehicle during loading of the patient transport litter thereupon. One or more of the plurality of wheels may comprise multi-directional wheels, e.g., to allow for omnidirectional rolling movement. The litter may be selectively lockable in and unlockable from the unfolded state, the fully-folded state, and optionally, one or more partially-folded state(s). In a system implementation, the patient transport litter and an emergency transport vehicle may include complimentary interconnection members to secure the patient transport litter to the emergency transport vehicle during transport.

26 Claims, 18 Drawing Sheets



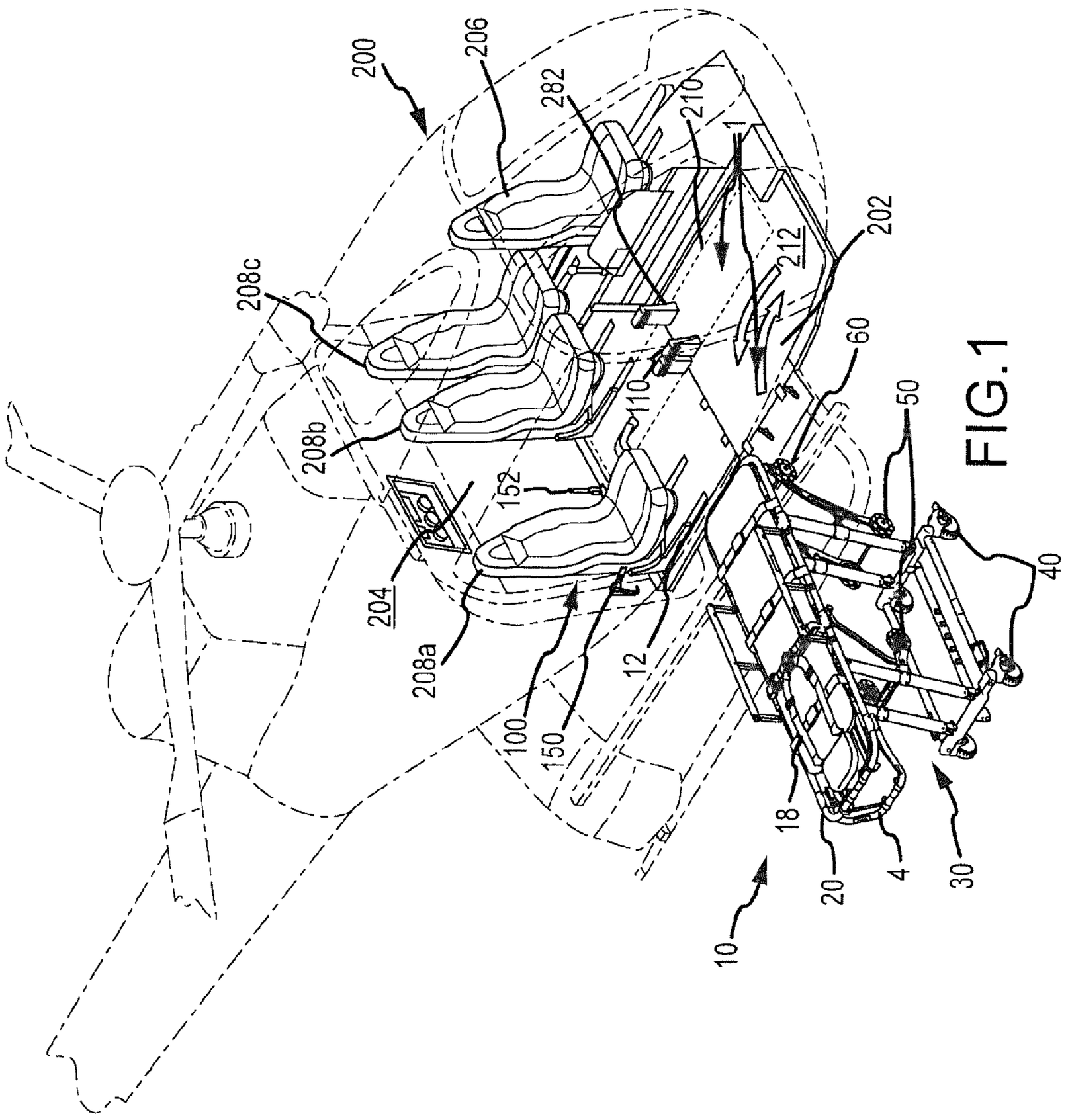

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FIG.1

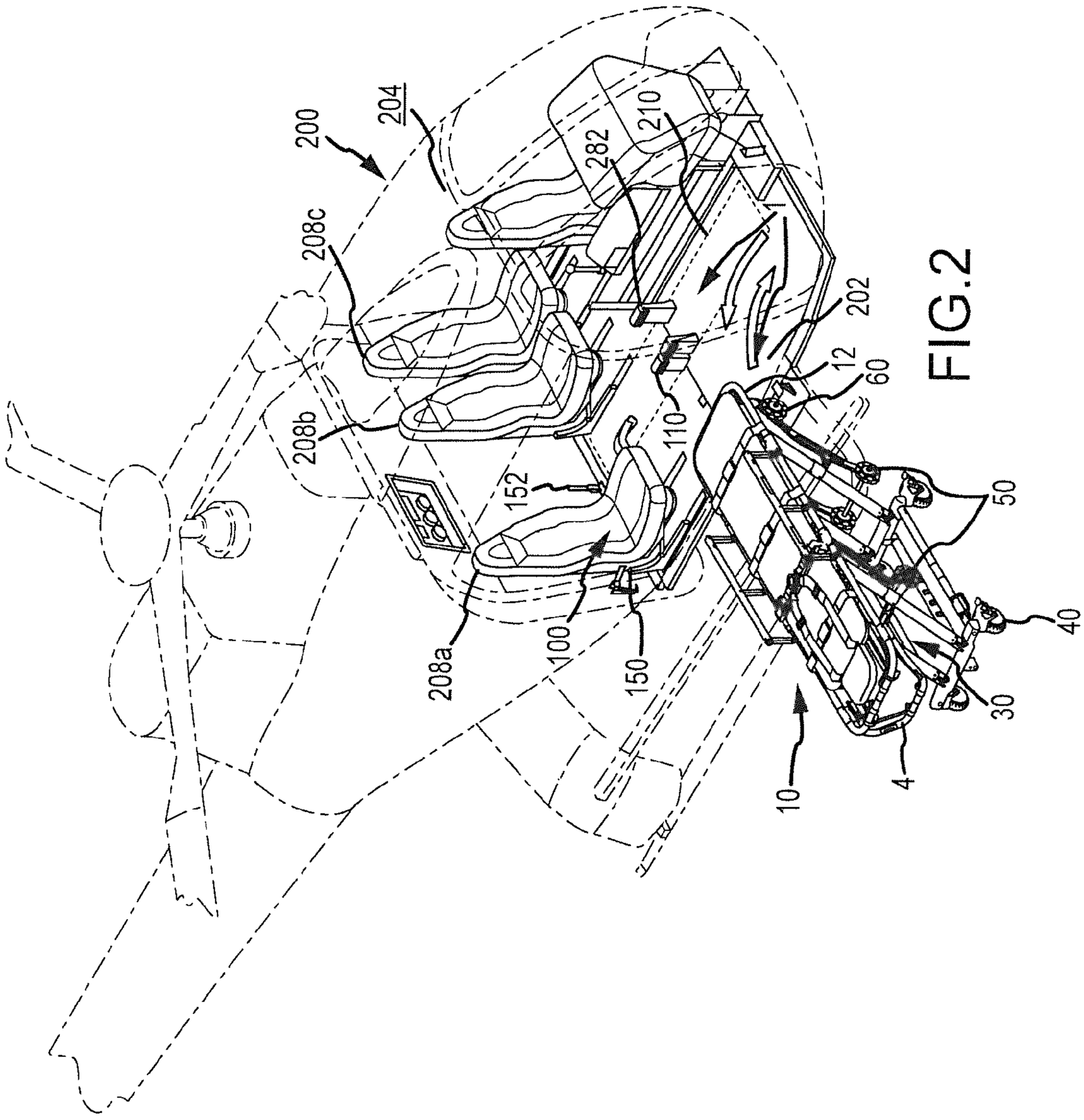
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FIG.2

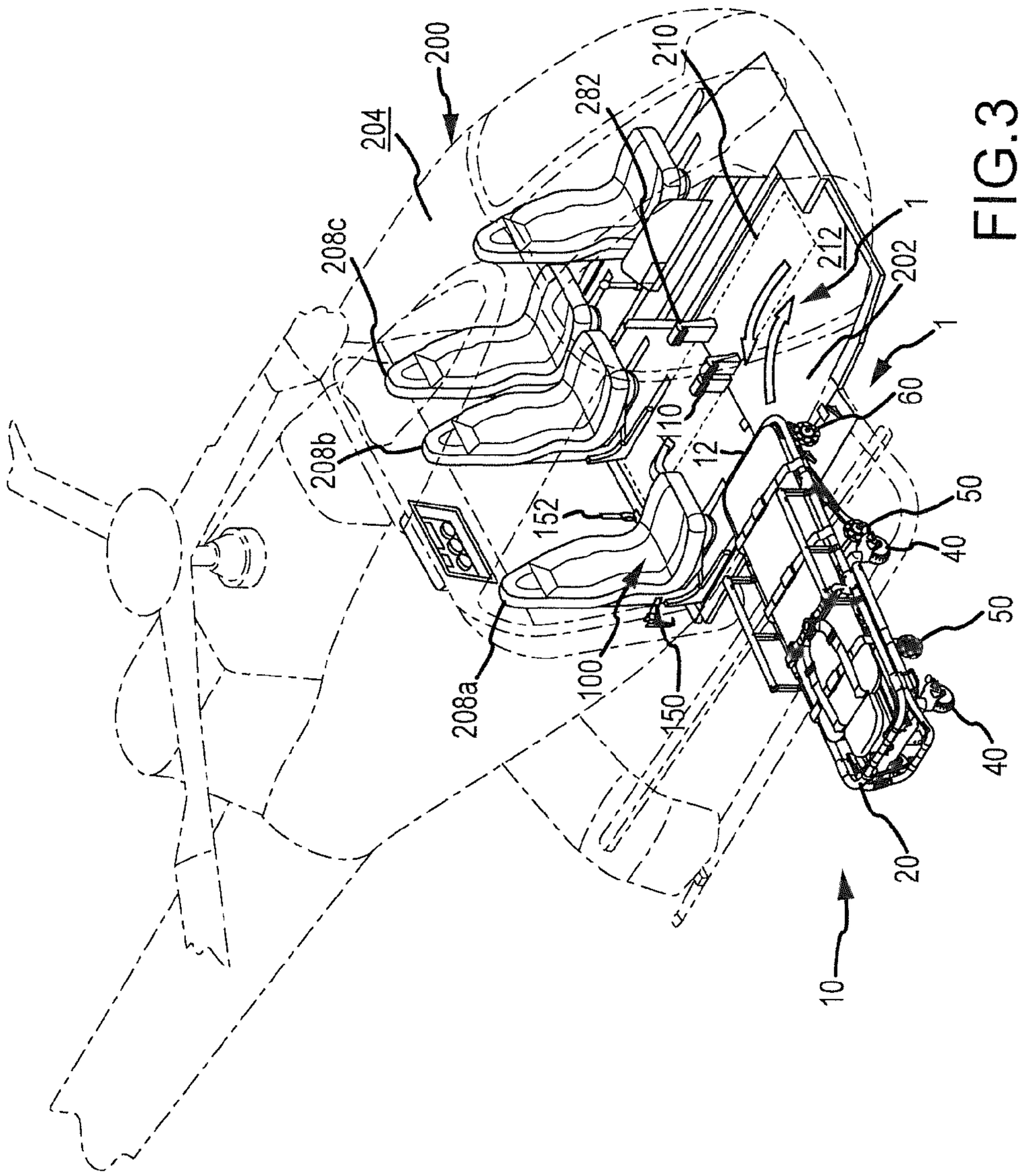
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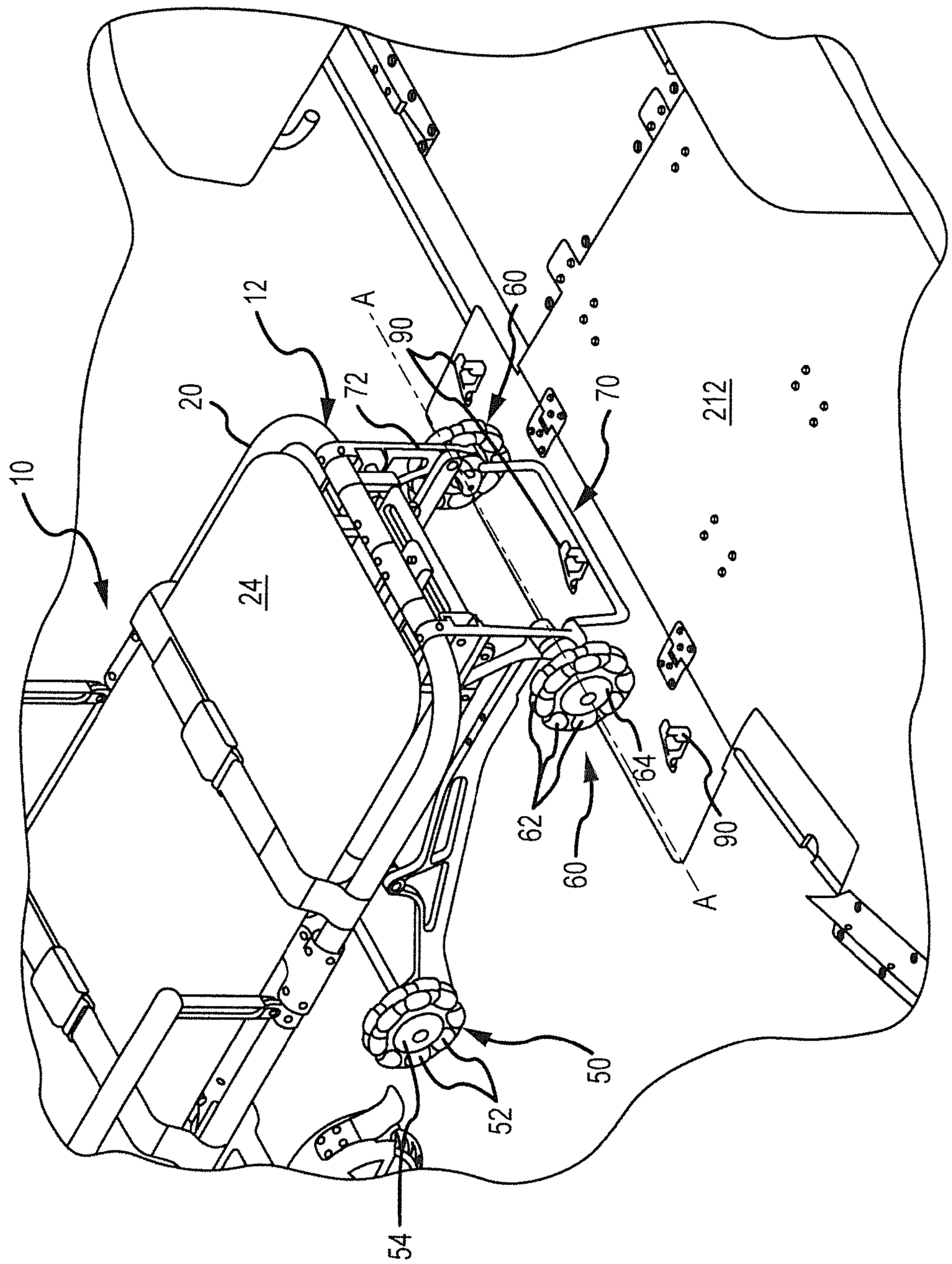
FIG.3



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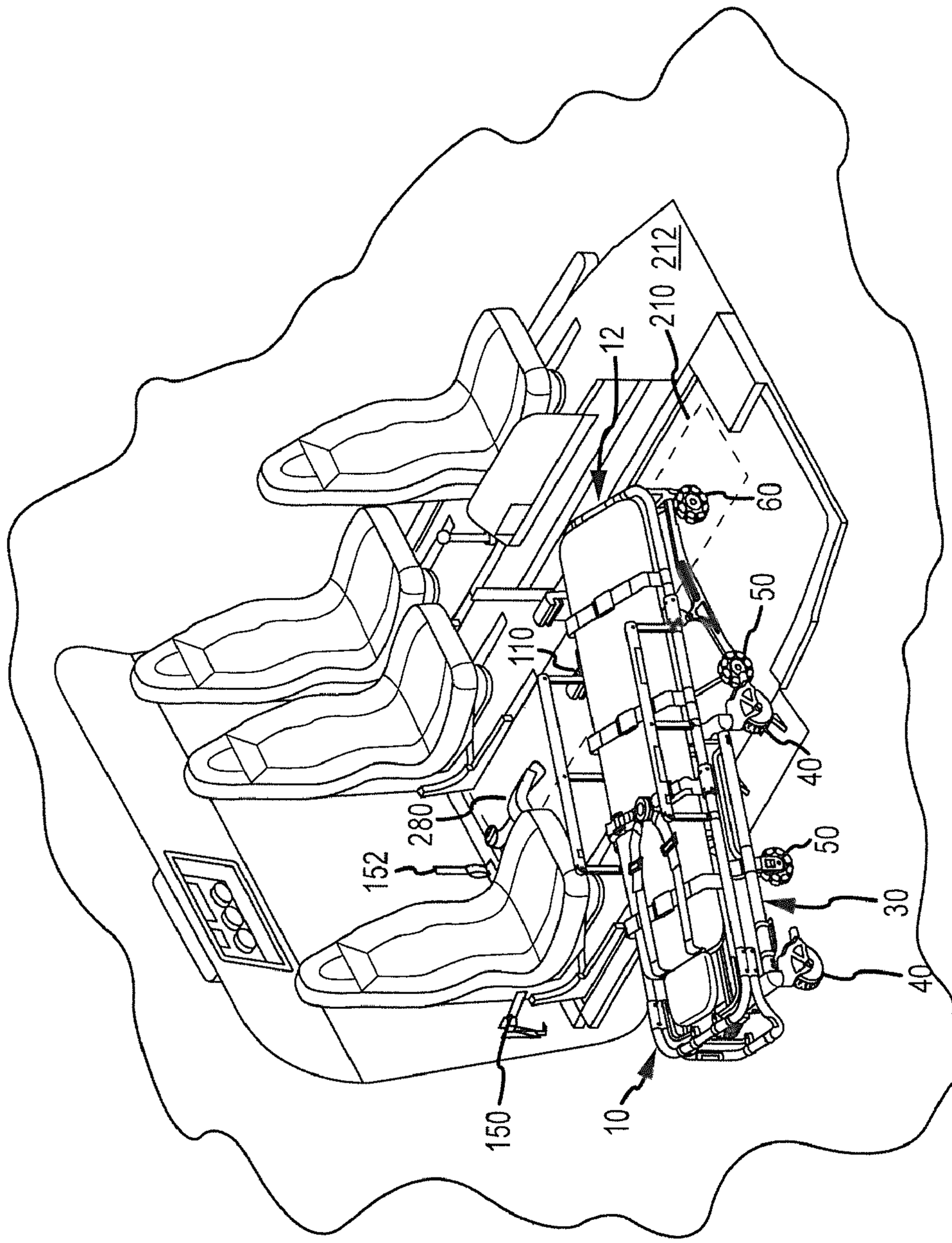

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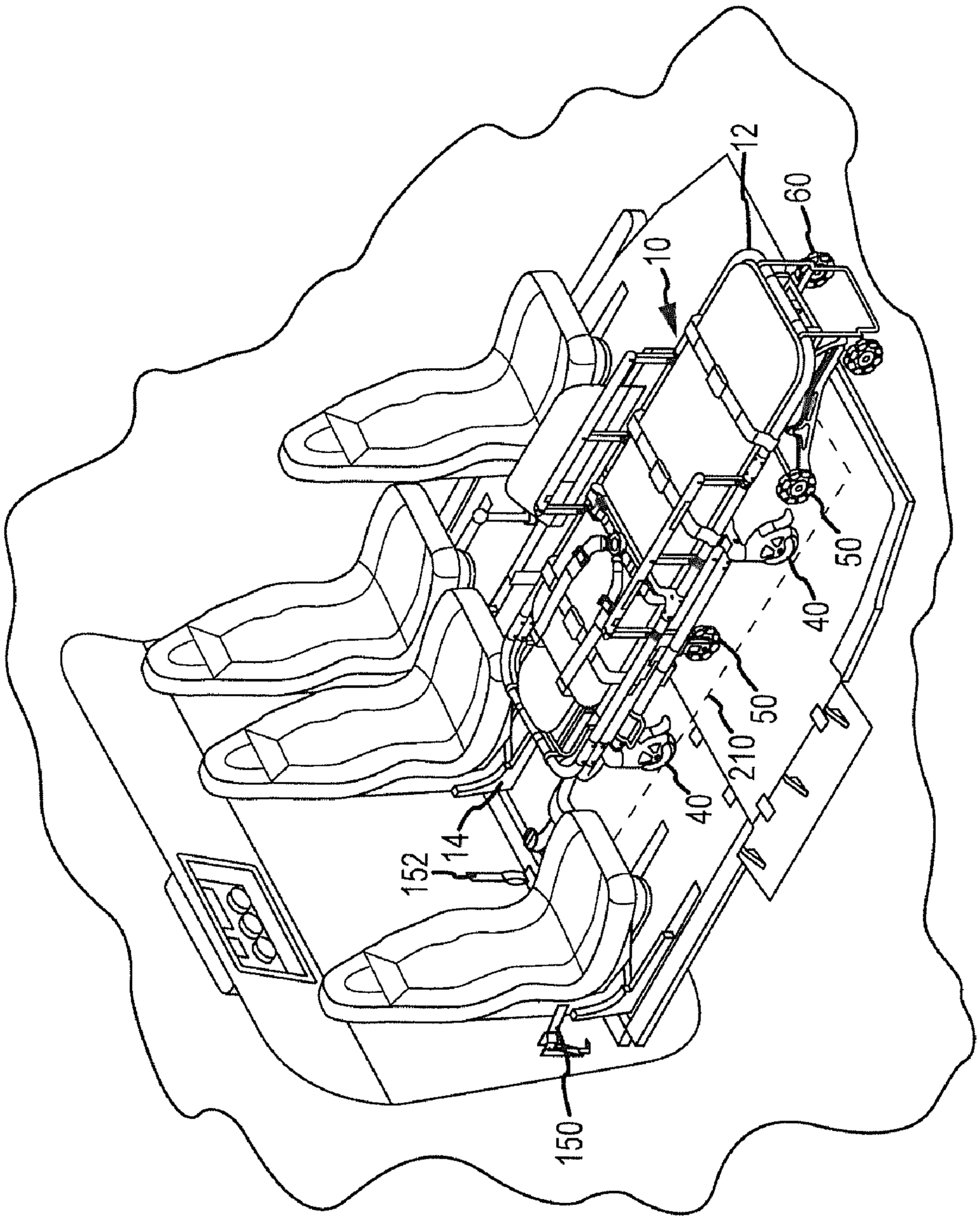

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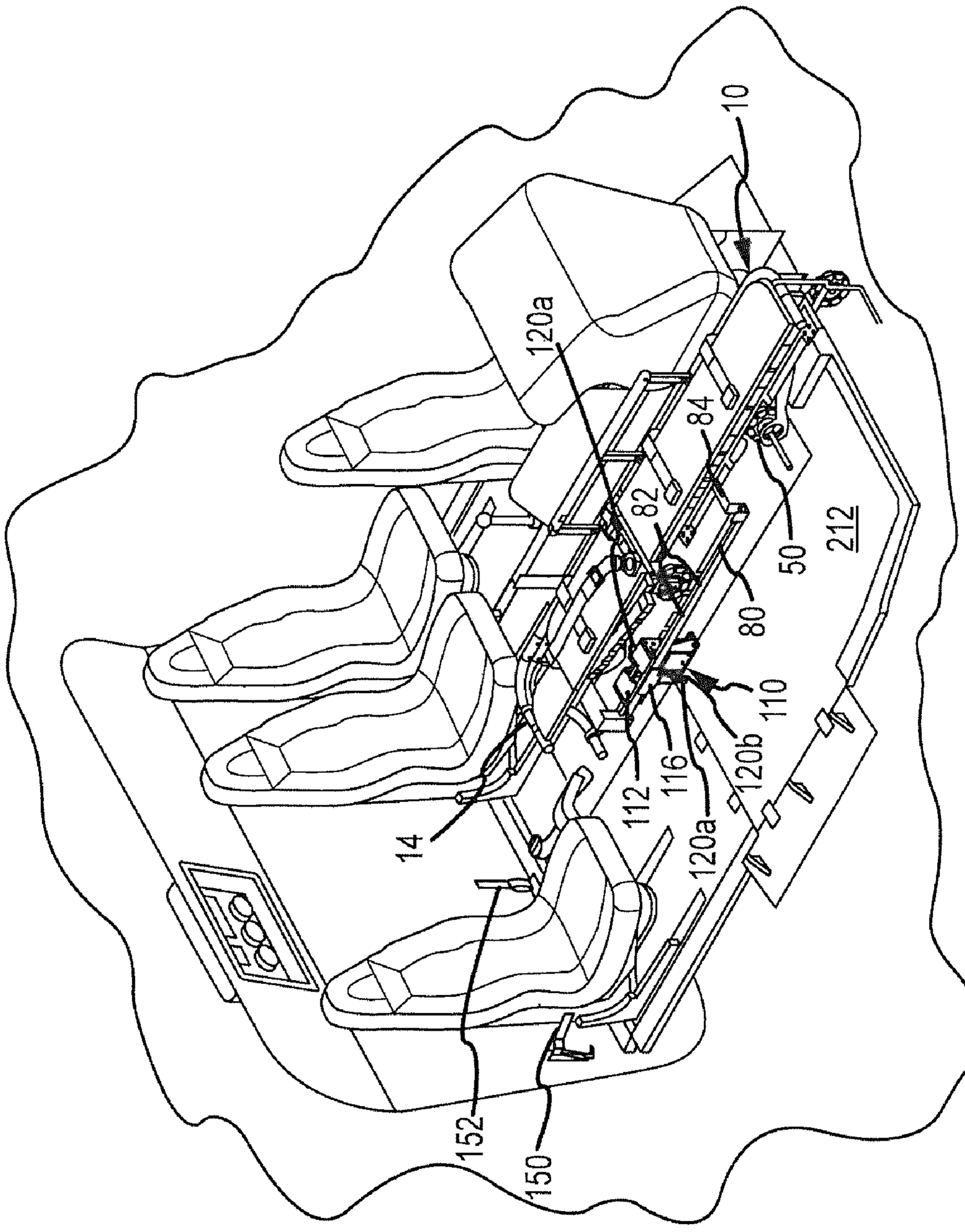
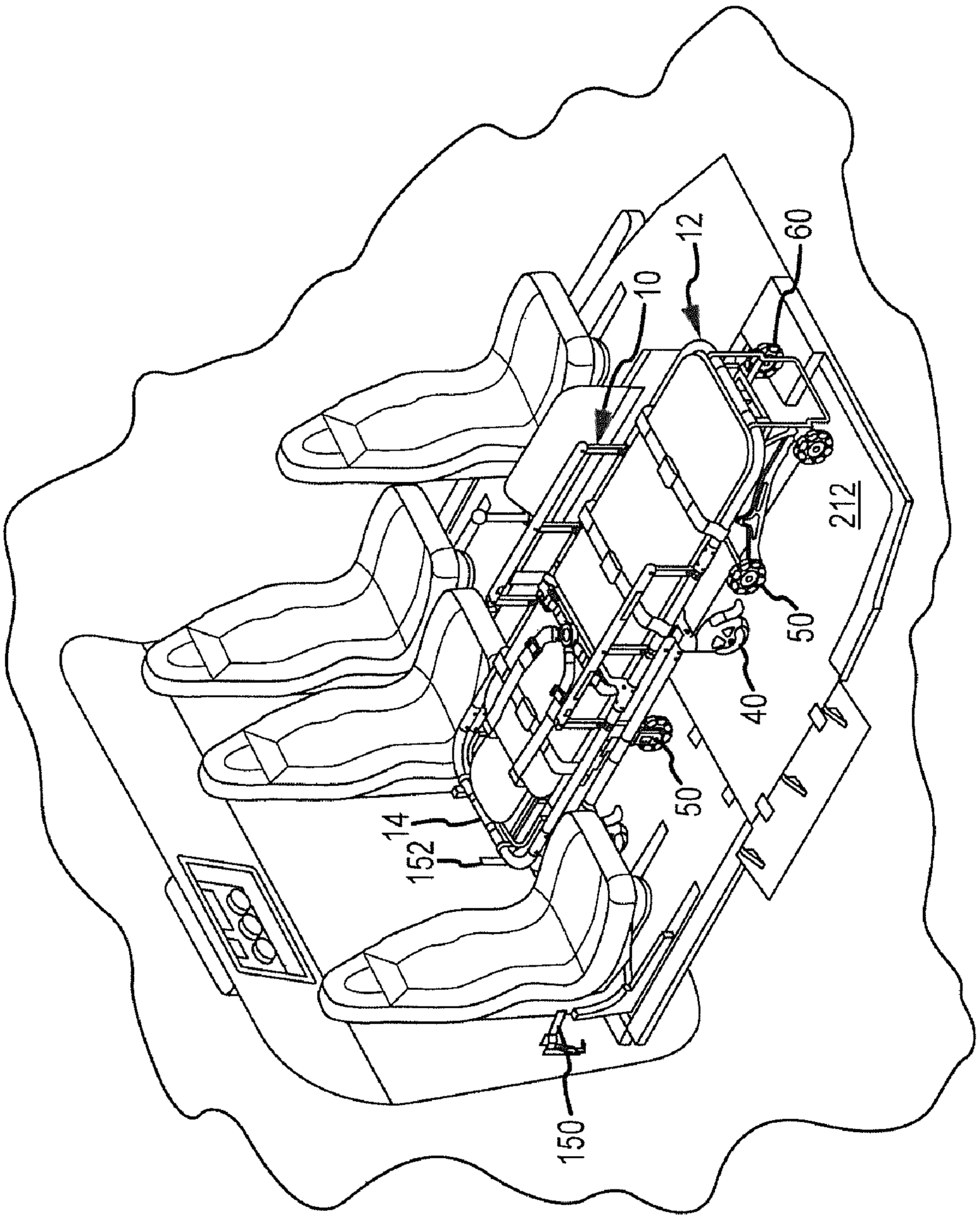


FIG.7



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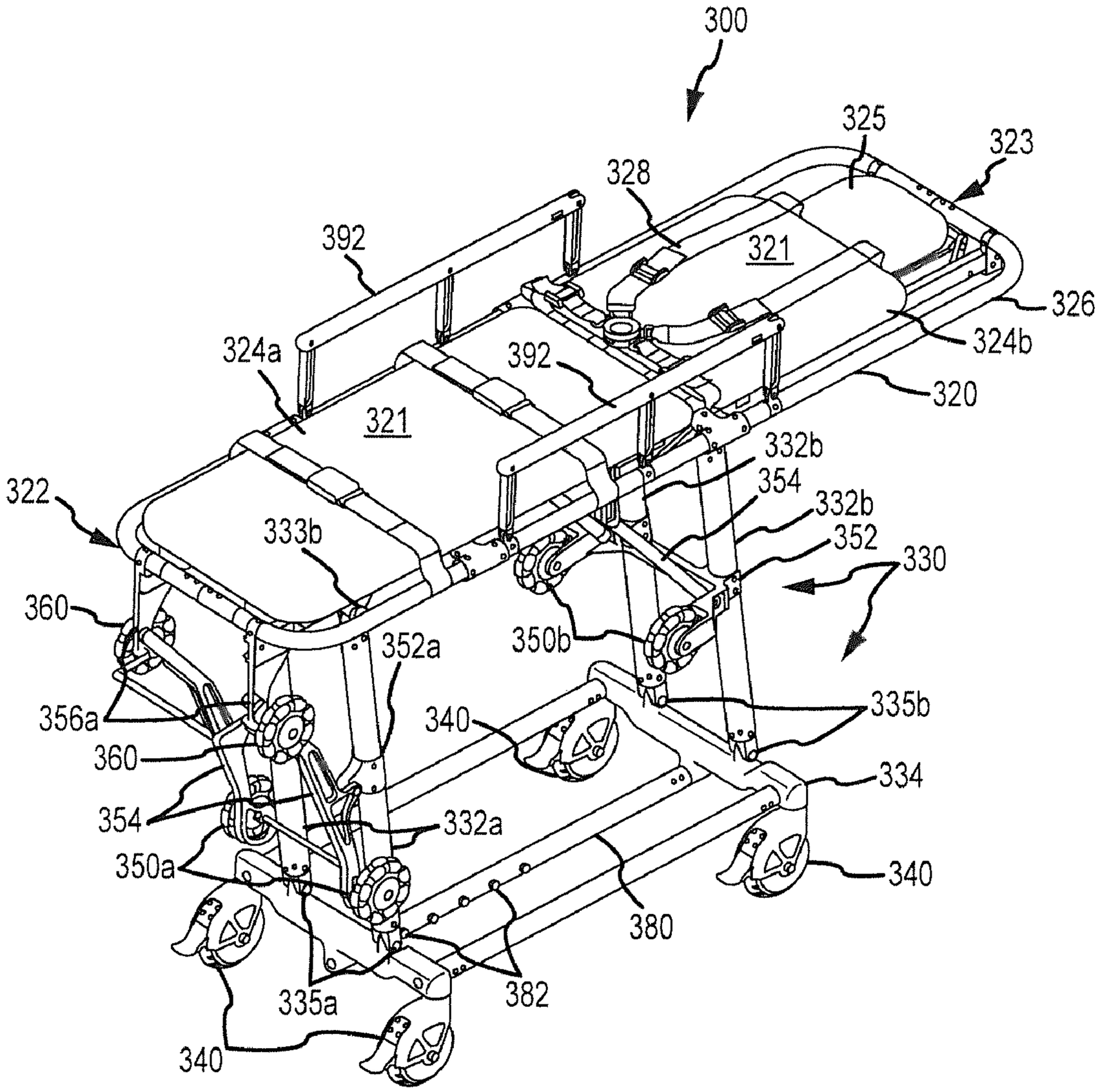
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335a
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FIG.9

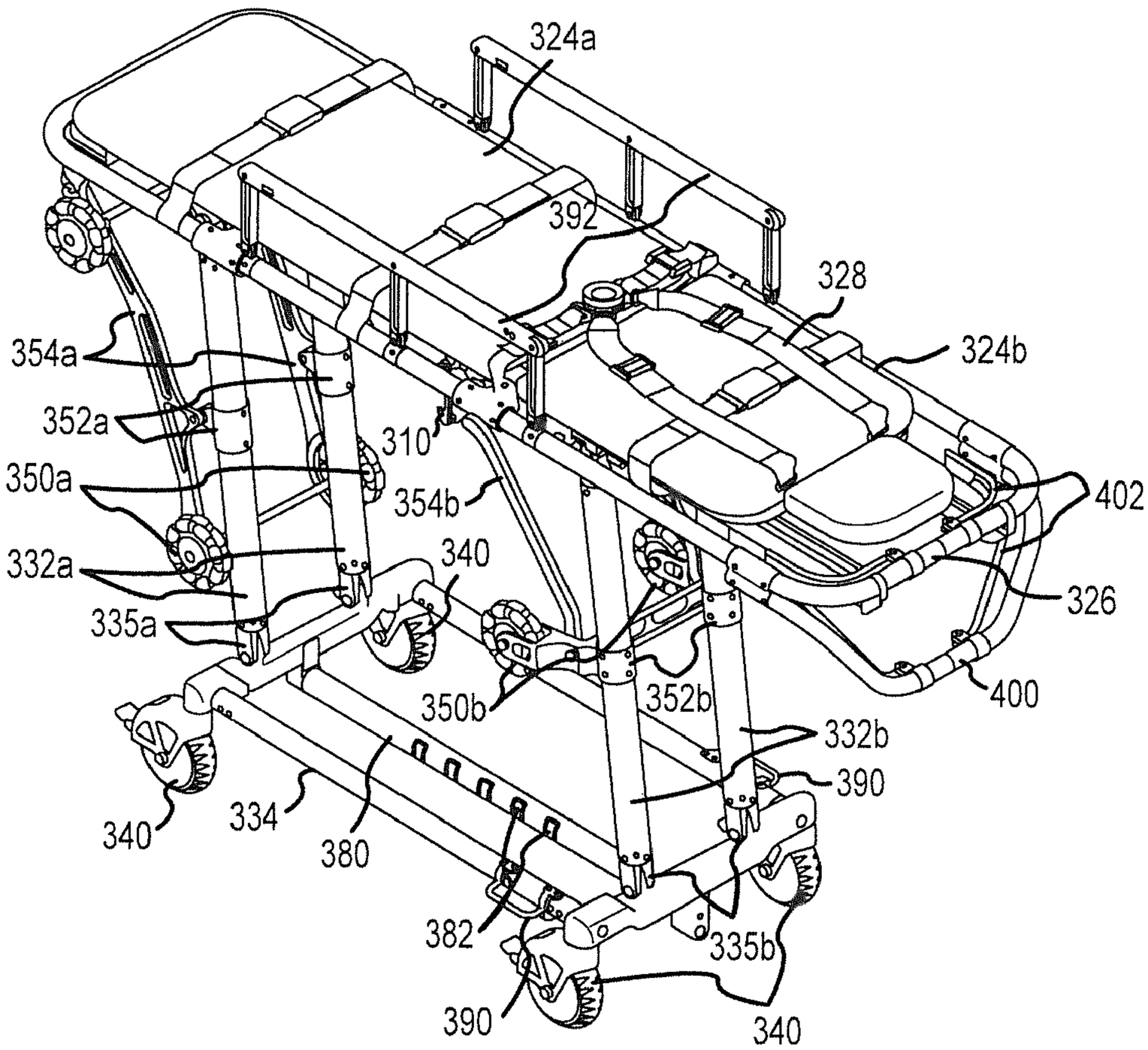
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FIG.10

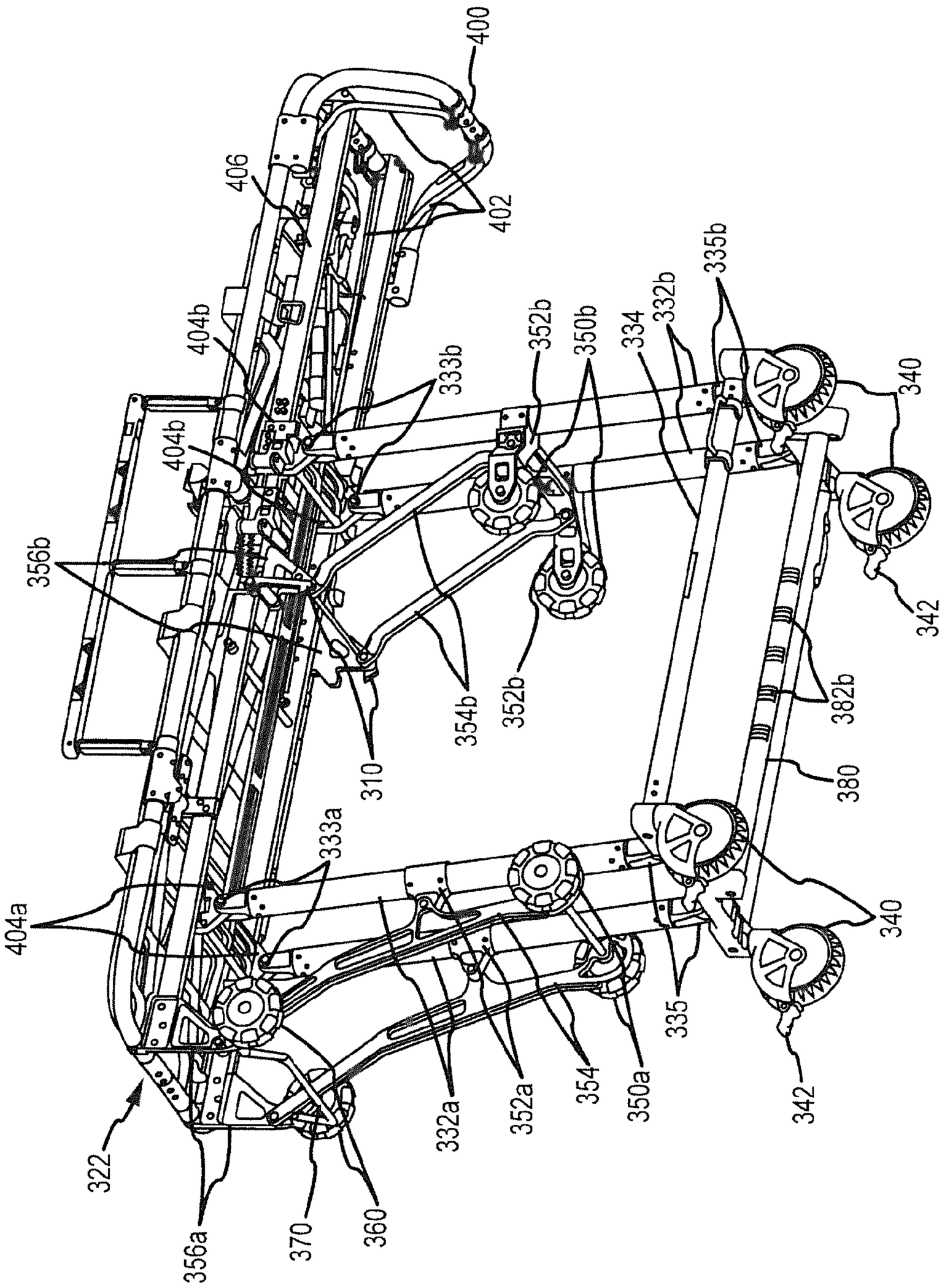
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FIG.11

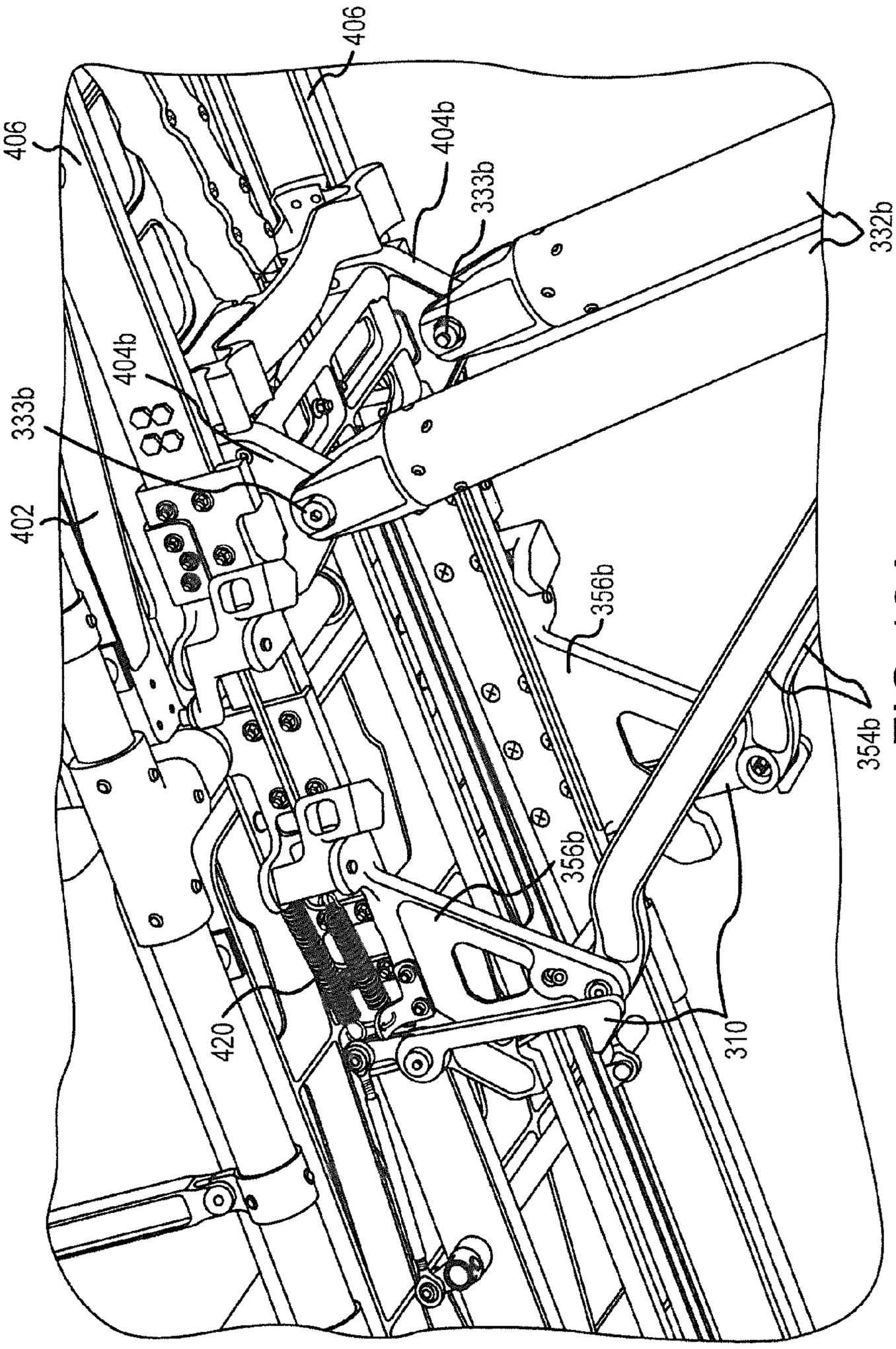

FIG.12A

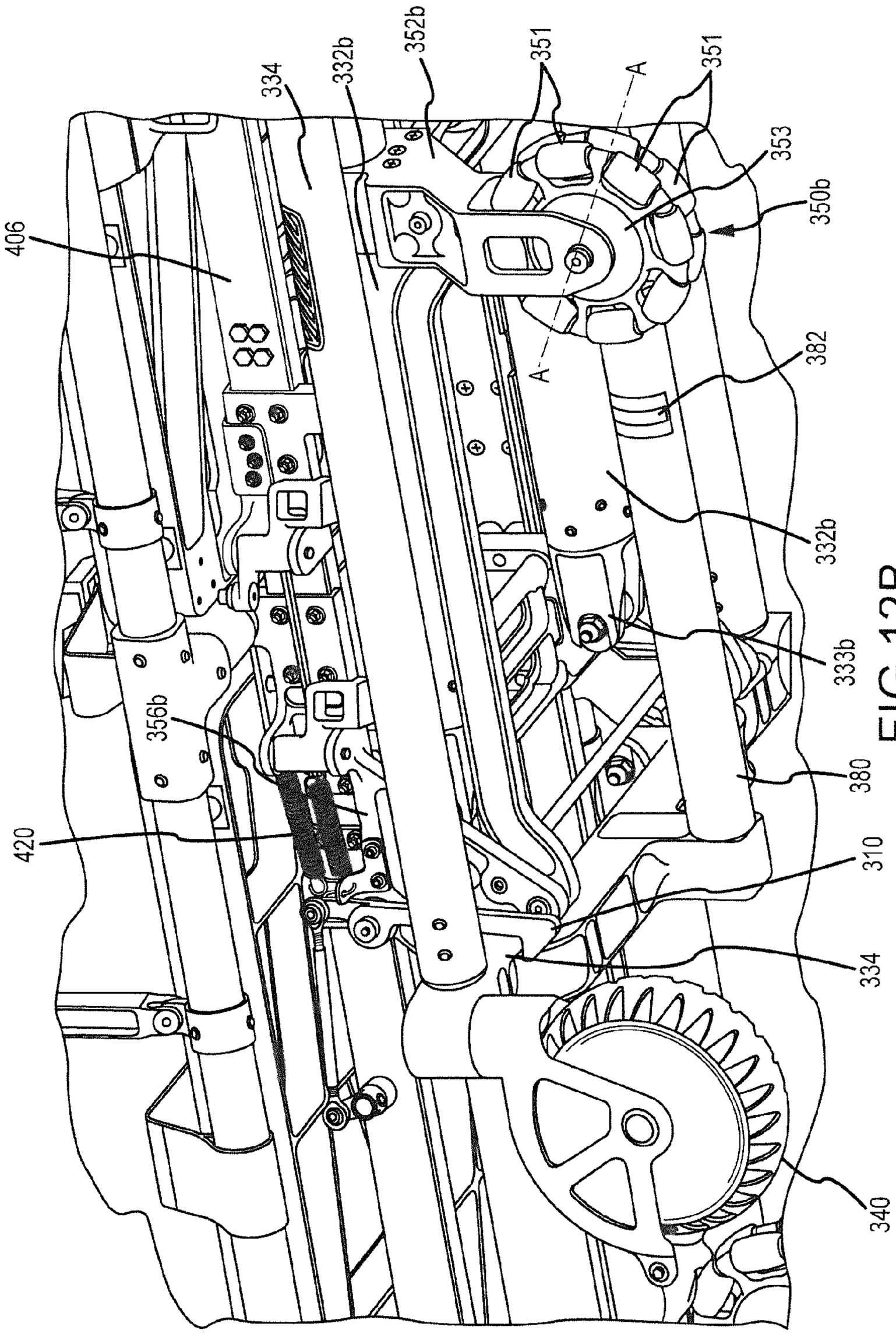
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FIG.12B

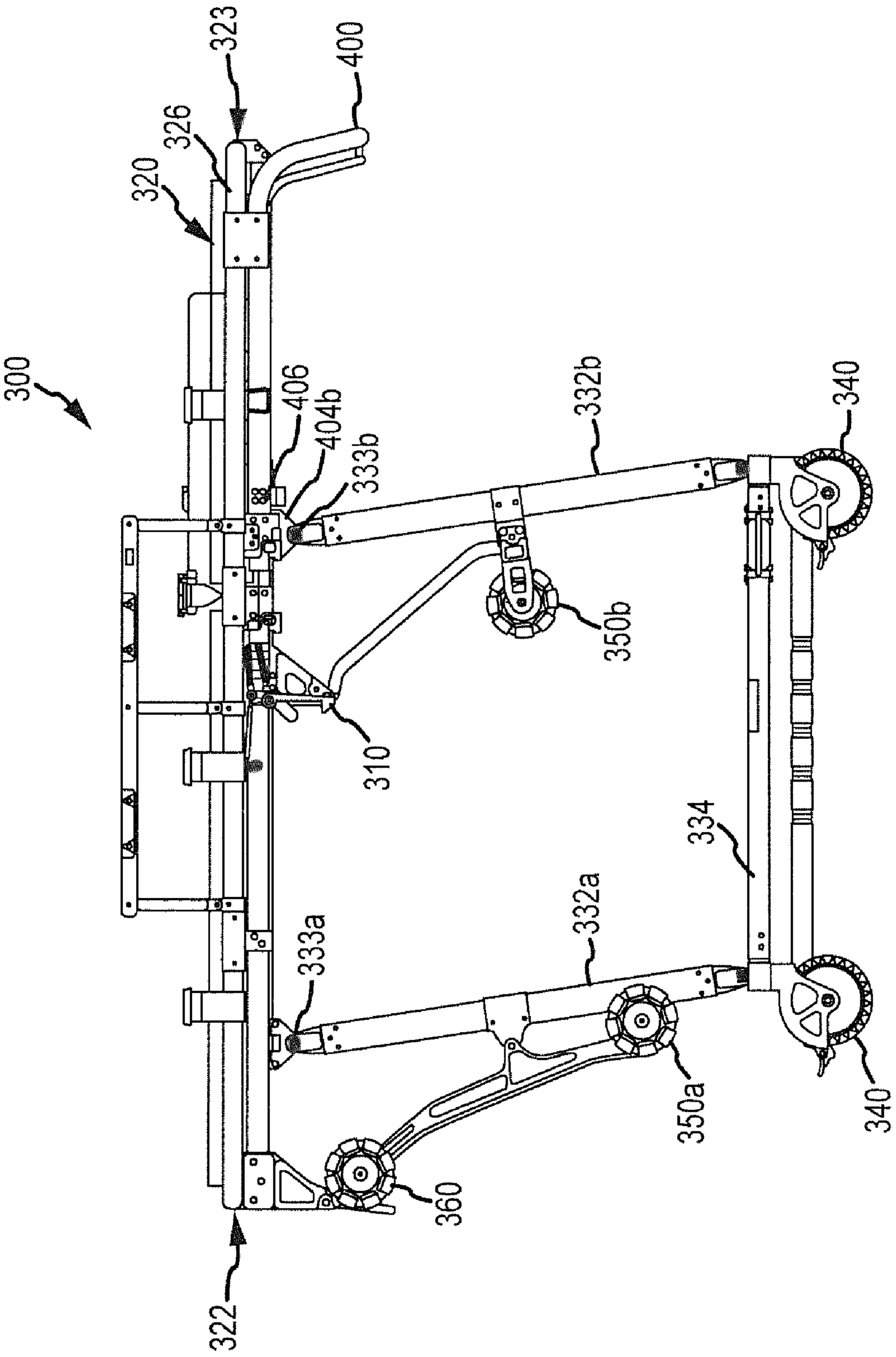
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FIG.13A

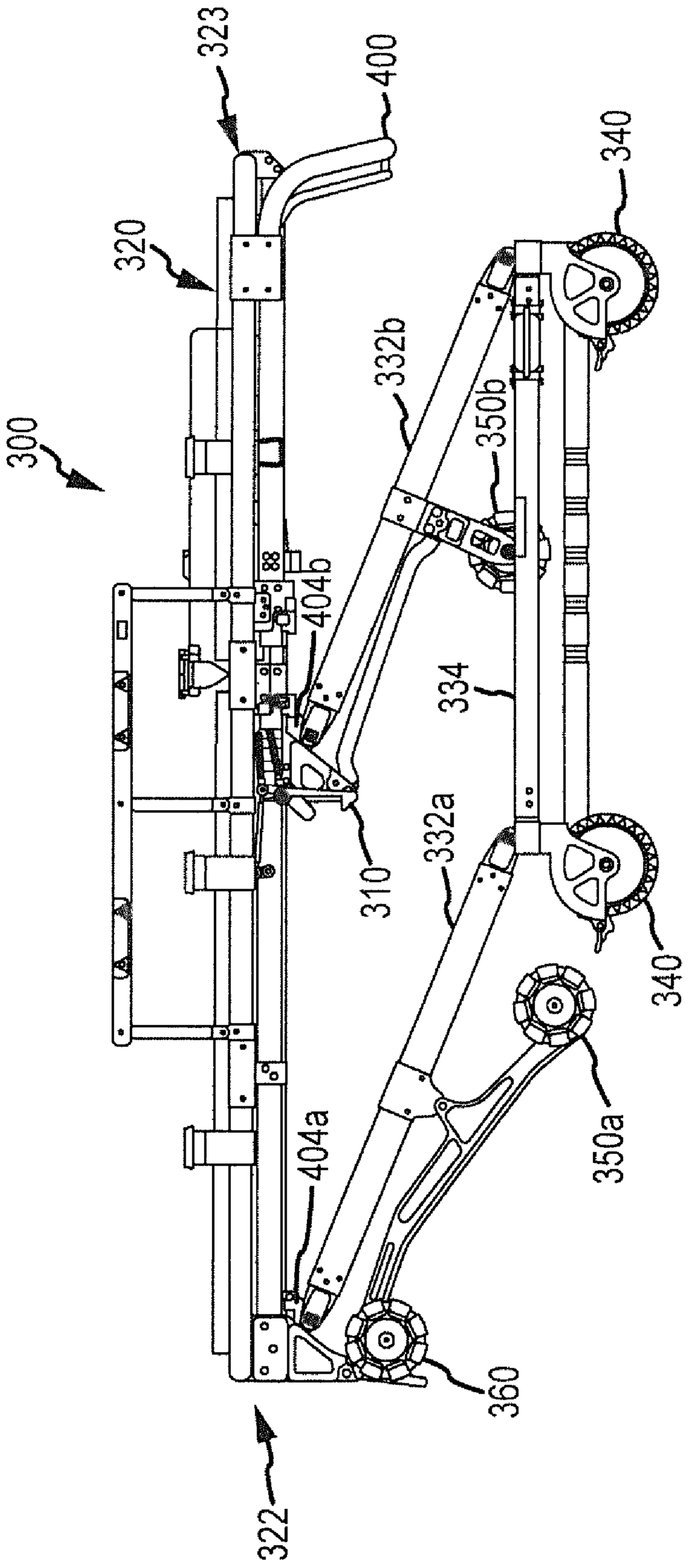
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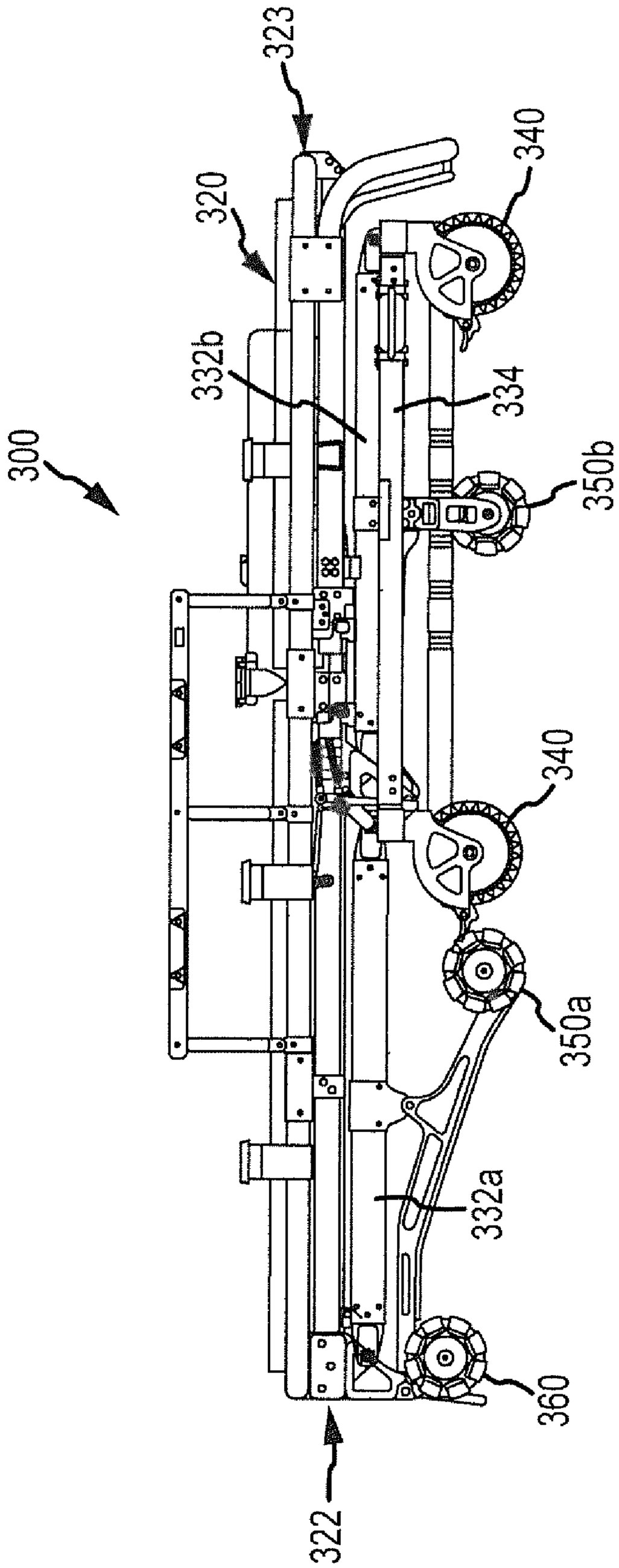
FIG.13B



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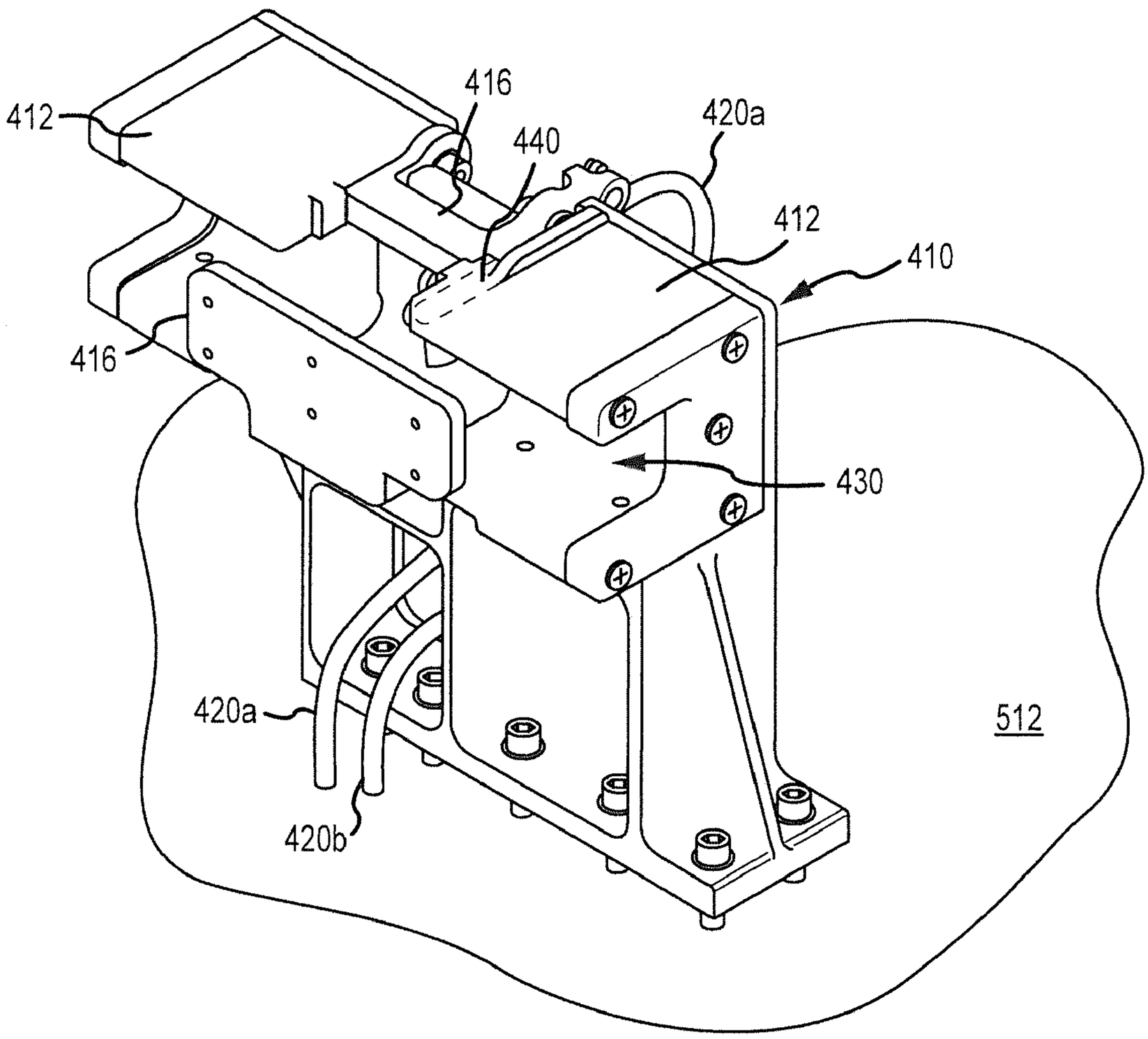

FIG.14A

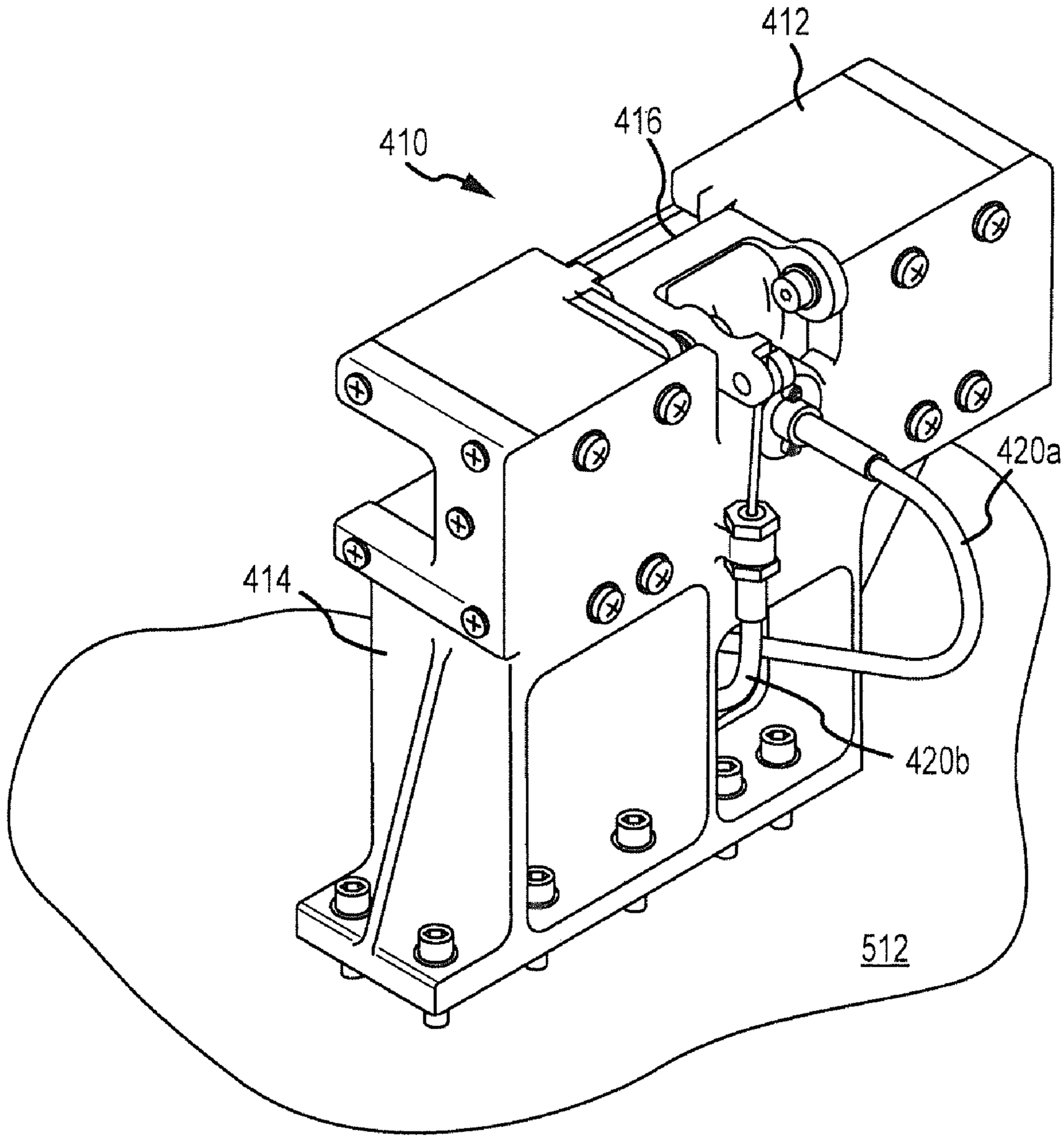

FIG.14B

ROLL-ON, FOLDABLE LITTER AND PATIENT HANDLING SYSTEM FOR EMERGENCY TRANSPORT VEHICLES

FIELD OF THE INVENTION

The present invention relates to the emergency transport of medical patients, and more specifically, to a portable litter and system for patient handling. The invention is particularly apt for use in connection with patient transport in emergency transport vehicles having side access ports for patient loading and unloading.

BACKGROUND OF THE INVENTION

In instances where a patient must be transported, and especially in emergency medical care situations, patients must typically be loaded into an emergency transport vehicle, transported from an emergency site (e.g., accident scene) to a medical facility (e.g., hospital or acute care facility), medically treated in route to the medical facility, and unloaded from the emergency transport vehicle for further medical treatment at the medical facility. In some situations, patients may be transported by more than one emergency transport vehicle in route to a medical facility. For example, a patient may be transported by a helicopter from an emergency site, then transferred to an ambulance for ground transportation to a medical facility.

As speed is of the essence in such situations, the loading, transporting, treating and unloading of the patient during this period should be conducted efficiently and effectively, and otherwise accommodate patient positioning for medical treatment. This is especially true in instances where an emergency pick-up site is in a remote area and/or medical evacuation situation. In this regard, the patient loading system and transport device should also be reliable and easy to operate.

In relation to the noted considerations, emergency transport vehicles typically present significant space constraints. This is particularly true for emergency transport vehicles having only side access ports for patient loading/unloading. In such arrangements, a patient litter may be raised and advanced into a side access port and translated from an orientation that is transverse to a longitudinal axis of the emergency transport vehicle (e.g., orthogonal) to an orientation that is aligned with the longitudinal axis. As may be appreciated, the performance of such translation in a small space, and in rapid and safe manner, presents significant challenges for medical personnel.

SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is to provide an easy-to-use patient transport litter and system for loading patients into and unloading patients out of an emergency transport vehicle, e.g., a helicopter or other aircraft, and for otherwise transporting and facilitating the treatment of such patients.

It is another object of the present invention to provide an improved patient transport litter capable of readily assuming different orientations on a support surface during loading, unloading and/or transporting of a patient. In this regard, a related objective is to provide an improved patient transport litter capable of being maneuvered onto and within emergency vehicles having only side access ports.

Yet another object of the present invention to provide a patient transport litter and system capable of enhancing the delivery of emergency medical treatment during transport.

One or more of the above-noted objectives are realized by the portable patient transport litter and system of the present invention. In one aspect, a patient transport litter may include a patient support platform for supporting a patient thereupon, and a frame interconnected to the patient support platform and selectively foldable between an unfolded state and a folded state.

By way of example, the litter may be moved to an emergency transport vehicle in an unfolded state, then folded and loaded onto the emergency transport vehicle in a folded state. In the later regard, the litter may further include a first plurality of wheels interconnected to the frame for rollable movement and supporting the frame and patient support platform when the frame is in a folded state, wherein each of the first plurality of wheels is multi-directional. More particularly, for a given orientation of the first plurality of wheels, the portable patient transport litter may be rollable in at least two different and preferably all directions (e.g., omnidirectional) when the frame is in a folded state (e.g. when loaded on to an emergency transport aircraft). Such capability facilitates space-efficient translation of a folded litter from an orientation transverse to a longitudinal axis of an emergency transport vehicle to an orientation aligned with such axis. In this regard, the improved patient transport litter is particularly apt for use with emergency transport vehicles having only side access ports for loading/unloading patients.

In various embodiments, the patient transport litter may further comprise a second plurality of wheels interconnected to the frame for roll supporting and rollable movement of the frame and the patient support platform with the frame in the unfolded state. For example, a patient may be placed on the litter with the frame unfolded and rolled from an initial patient loading site (e.g. an emergency site) to an emergency transport vehicle. Further, the second plurality of wheels may be utilized to roll the litter on to and within certain types of emergency transport vehicles (e.g. ambulances) and/or within a medical facility after emergency transport.

In certain implementations, the patient transport litter may further include a third, or leading, plurality of wheels interconnected to and extending away from a first end portion of the patient support platform. Such first end portion may correspond with an end of the patient support platform that is intended to be first advanced into an emergency transport vehicle (e.g. an end intended for supporting a lower body portion of a patient), wherein the third plurality the wheels may roll on engage a floor of an emergency transport vehicle (e.g. a helicopter) in an initial stage of patient loading, e.g. with the frame being folded to a folded state. The third plurality of the wheels may be multi-directional, wherein for a given orientation of the third plurality of wheels, the first end portion of the patient support platform is rollable in at least two different directions and preferably all directions (e.g., omnidirectional). Such feature further facilitates litter positioning within a relatively small cabin area of an emergency transport vehicle.

By way of example, when multi-directional wheels are utilized for the first plurality and/or third plurality of wheels, each of such plurality of wheels may include at least a plurality of roll members that are interconnected and disposed about a circle for co-rotation together about a wheel rotational axis. Further, each of such roll members may be separately rollable about a corresponding roller axis that is transverse to the wheel rotational axis (e.g. substantially orthogonal). As may be appreciated, such an arrangement facilitates rollable, multi-directional movement in at least two different directions, e.g., omnidirectional movement in all directions, thereby facilitating litter maneuverability within a relatively

small space. In this regard, multi-directional wheels may be rolled without swiveling, or rotating, a caster.

In some implementations, the foldable frame may comprise an upper first frame portion pivotally interconnected to a patient support platform, and a lower second frame portion, wherein the first frame portion is also pivotally interconnected to the second frame portion. By virtue of such pivot interconnections, the patient support platform may be selectively pivoted between a first pivot position with the frame in an unfolded state, and a second pivot position with the frame in a folded state (e.g., wherein the first position may be elevated relative to the second position). Further in this regard, the patient transport litter may be provided so that the patient support platform is maintainable in a predetermined orientation relative to the second frame portion (e.g. substantially parallel thereto) when the frame is in either the unfolded state or folded state, and throughout pivotal movement of the patient support platform between the corresponding first and second pivot positions.

Furthermore, the patient transport litter may be selectively controllable to be locked with the patient support platform in an unfolded state, a folded state and/or a partially-folded state, and to be selectively unlocked from any of such state(s). In one implementation, the patient transport litter may be selectively locked into and unlocked from each of a fully-unfolded state, a fully-folded state and at least one intermediate state therebetween, wherein in the intermediate state a patient may be positioned at an intermediate height to facilitate the provision of medical care (e.g., cardiopulmonary resuscitation (CPR)).

In some embodiments, the patient transport litter may be provided so that the first frame portion may be longitudinally moveable relative to the patient support platform. In turn, the patient support platform may be moveable from a first longitudinal position relative to the first frame portion to a second longitudinal position relative to the first frame portion in conjunction with pivotal movement of the patient support platform between first and second pivot positions. In certain implementations, the first frame portion may be pivotally interconnected to the patient support platform at interconnection locations that are longitudinally moveable along the patient support platform (e.g., slidably and/or rollable along the patient support platform).

In one approach, a first plurality of wheels may be interconnected to a first frame portion for rollable movement of and for supporting the frame and the patient support platform when the frame is in a folded state (e.g. when loaded on to an emergency transport vehicle), and a second plurality of wheels may be interconnected to a second frame portion for rollable movement of and for supporting the frame and patient support platform when the frame is in an unfolded state. Additionally, a third plurality of wheels may be interconnected to a first end of patient support platform for rollable movement of and for supporting the first end in conjunction with patient loading and/or unloading from an emergency transport vehicle (e.g. an aircraft). In this regard, the third plurality of wheels may be fixedly disposed at a first distance from the patient support platform and the first plurality of wheels may be spaced at a second fixed distance from the patient support platform with the frame in a folded state, wherein the first distance is less than the second distance. For example, the first and third plurality of wheels may be provided so that, when the patient transport litter is fully positioned onto an emergency transport vehicle, the first plurality of wheels are disposed to support the patient support platform and roll upon a floor of the emergency transport vehicle, and the third plurality of wheels are disengaged from the floor of the emergency transport vehicle.

In another aspect, the patient transport litter may be adapted for selective interconnection to and disconnection from a connection member mounted to an emergency transport vehicle (e.g., fixedly connected to a floor of the emergency transport vehicle). In various embodiments, the frame of the patient transport litter may comprise a plurality of connection locations disposed along a length of the litter, wherein a selected one of the plurality of the connection locations may be interconnected to a complimentary connection member mounted to an emergency transport vehicle. As may be appreciated, the provision of a plurality of different connection locations facilitates selective fixed positioning of a patient transport litter at any one of a plurality of positions within an emergency transport vehicle, thereby facilitating access by medical personnel to a patient disposed on the litter during patient transport.

In one arrangement, the portable patient transport litter includes a longitudinal member extending along a portion of a length of the patient transport litter, e.g. below the patient support platform. Relatedly, a connection receiver mounted to the floor of an emergency transport vehicle may include a u-shaped channel, oriented and sized to receive the longitudinal member. The connection member may further include a closure member for closing the u-shape channel when the longitudinal member is located therewithin. Such an arrangement restrains lateral, side-to-side movement of the litter relative to the receiver, while allowing relative longitudinal movement of the litter relative to the receiver, e.g. in a direction aligned with a longitudinal axis of the channel of the receiver.

In one implementation, to restrain relative longitudinal movement of the longitudinal member and litter, relative to the receiver, a plurality of apertures may be provided along a length of the longitudinal member. Correspondingly, the receiver may include a spring-loaded pin member sized for receipt within any selected one of the apertures. A first control member may be provided to selectively retract the pin member against the loading of a spring member to facilitate relative aligned positioning of and locking interface between the pin member of the receiver and the longitudinal member. Further, a second control member may be provided to selectively open the closure member to allow the longitudinal member to be removed from the u-shaped channel.

In a further related aspect, a first end of the patient transport litter may be adapted for selective engagement with a retention member interconnected to an emergency transport vehicle at a side access port thereof. Such retentive engagement may be established during at least a portion of a patient unloading procedure, e.g. to establish an anchor location as the patient transport litter is unloaded from an emergency transport vehicle.

In one approach, a lateral member may be interconnected to a first end of the patient support platform, wherein the lateral member extends below and along at least a portion of a width of the patient support platform. Correspondingly, a retention member interconnected to the emergency transport vehicle at the side access port thereof may define an inward-facing (e.g., toward the interior of the helicopter), u-shaped recess for receiving the lateral member therewithin. By way of example, the first end of the litter may be maneuvered to locate the lateral member in the retention member.

As may be appreciated, an inventive patient handling system that includes a connection member and/or a retention member interconnected to an emergency transport vehicle, together with one or more above-noted features of a patient

transport litter, is also provided. Such patient handling system may be utilized so that a patient may be loaded a single time on to a patient transport litter and reliably loaded onto, readily positioned, and secured within, and unloaded from an emergency transport vehicle.

In conjunction with the present invention, an improved method for emergency transport patient transport also is provided. The method may include the steps of positioning a patient on a patient support platform of a portable patient transport litter, and moving the litter, with the patient disposed thereupon, to an emergency transport vehicle. The method may further include the steps of loading the portable patient transport litter, with the patient disposed thereupon, into the emergency transport vehicle (e.g. through a side access port located on a side of the emergency transport vehicle), and rolling the portable patient transport litter on a first plurality of wheels (e.g., multi-directional wheels) of the portable patient transport litter to a desired location within the emergency transport vehicle, wherein for a given common orientation of the first plurality of wheels the portable patient transport litter is rollable in at least two different directions and preferably in all directions.

In one approach, the rolling step may comprise rotating each of the first plurality of wheels about a corresponding wheel rotation axis in a first direction (e.g. on a floor of an emergency transport vehicle), wherein each of the first plurality of wheels includes at least a first plurality of roll members interconnected and disposed about a circle. In turn, the rolling step may further include rolling at least one of the first plurality of roll members of each of the first plurality of wheels in a second direction transverse to the first direction.

The moving step of the inventive method may include rolling the portable patient litter, with the patient disposed thereupon, on a second plurality of wheels comprising the portable patient transport litter. By way of example, a portion of such rolling step maybe completed after the positioning of a patient on the litter and prior to the loading step (e.g. during transport from an emergency site to an emergency transport vehicle).

In another aspect, the loading step of the method may include folding a frame of the portable patient transport litter from unfolded state (e.g., expanded) to a folded state (e.g., collapsed). In one arrangement, the frame may include an upper, first frame portion and a lower, second frame portion, wherein the folding step includes pivoting the patient support platform, with the patient disposed thereupon, relative to the first frame portion, and pivoting the first frame portion relative to the second frame portion. In one implementation, the folding step may further include moving the first frame portion relative to the patient support platform with the patient disposed thereupon. For example, the first frame portion may be disposed to slide or roll along the patient support platform during at least a portion of the folding step.

In certain implementations the method may further include the steps of locking the patient transport litter in the unfolded sate, and unlocking the patient transport litter from the unfolded state prior to the folding step. In addition, the method may include locking the patient transport litter in a fully-folded state and unlocking the litter from the fully-folded state. By way of example, locking in the fully-folded state and/or unfolded state may be realized automatically. Further, the method may include locking the patient transport litter in a partially-folded state, and unlocking the patient transport litter from the partially-folded state. In this regard, such locking may be realized automatically in conjunction with folding the patient transport litter (e.g., automatic locking may be provided at an intermediate, partially-folded state to facilitate the application of CPR procedures).

In one implementation, the step of loading the transport litter into the emergency transport vehicle may include rolling a first end portion thereof on a second or leading plurality of wheels comprising the transport litter. In this regard, the second plurality of wheels may be multi-directional, wherein for a given orientation of the second plurality of wheels the transport litter is rollable in at least two different directions and preferably in all directions. In this regard, each of the second plurality of wheels may include at least a first plurality of roll members interconnected and disposed about a circle. In turn, rolling of the first end portion of the litter may include rotating each of the second plurality of wheels about a corresponding wheel rotation axis in a first direction, and rolling at least one of the first plurality of roll member of each of the second plurality of wheels in a second direction.

In yet another aspect, an inventive method may include connecting the transport litter at the above-referenced desired location within the emergency transport vehicle. For example, such interconnection may entail positioning of a first connection member of the transport litter within a receiver fixed to the emergency transport vehicle at the above-referenced desired location within the emergency transport vehicle, wherein the transport litter is restrained from movement in at least one direction by the receiver. By way of example, the first connection of the transport litter may comprise a longitudinal member extending below and along the patient support platform. Relatedly, the receiver may comprise a u-shaped channel aligned or parallel to a longitudinal axis of the emergency transport vehicle. In conjunction with the above-noted positioning step, the method may further include the steps of adjusting the position of the transport litter relative to and with the first connection member located within the receiver, and releasably locking the transport litter into a selected one of a plurality of different available transport positions relative to the receiver. Such arrangement may also be adapted to allow for position adjustment and releasable locking of the litter in a desired, fixed position relative to the second emergency transport vehicle.

In a further additional aspect, the method may include loading the transport litter, with the patient disposed thereupon, into a second emergency transport vehicle. In this regard, the method may further include positioning a second connection member of the transport litter within another connector fixed to the second emergency transport vehicle so as to restrain the transport litter from movement in at least one direction.

Numerous additional features and advantages of the present invention will become apparent to those skilled in the art upon consideration of the embodiment descriptions provided hereinbelow.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a patient handling system embodiment showing a patient transport litter positioned adjacent to emergency transport vehicle.

FIG. **2** is a perspective view of a patient handling system embodiment of FIG. **1** showing the patient support litter being folded in conjunction with loading into the emergency transport vehicle in a fully unfolded or raised position.

FIG. **3** is a perspective view of the patient handling system embodiment of FIGS. **1** and **2** showing the patient transport litter fully-folded at the side access port of the emergency transport vehicle.

FIG. **4** is a perspective view of the patient handling system embodiment of FIGS. **1-3** showing a first end of the patient transport litter engaging a retention member at a side access port of the emergency transport vehicle.

FIG. **5** is a perspective view of the patient handling system embodiment of FIGS. **1-4** showing the patient transport litter partially advanced into the emergency transport vehicle.

FIG. **6** is a perspective view of the patient handling system embodiment of FIGS. **1-5** showing the patient transport litter being fully advanced into the emergency transport vehicle.

FIG. **7** illustrates the patient handling system embodiment of FIGS. **1-6** with the patient transport litter located the position shown in FIG. **6** and with the transport litter and a floor of the emergency transport vehicle shown cut-away to illustrate an embodiment for interconnection between a longitudinal member of the patient transport litter and a receiver mounted to the floor of the emergency transport vehicle.

FIG. **8** is a perspective view of a patient handling system embodiment of FIGS. **1-7** showing the patient transport litter rolled to a rearward position between workstation for medical personnel.

FIG. **9** is a first top isometric view of a patient transport litter embodiment employable in the patient handling system embodiment of FIGS. **1-8**.

FIG. **10** is a second top isometric view of the patient transport litter embodiment of FIG. **9**.

FIG. **11** is a first bottom isometric view of the patient transport litter embodiment of FIG. **9**.

FIG. **12**A is a segmented first bottom isometric view of a central portion of the patient transport litter embodiment of FIG. **9** in a fully-folded state.

FIG. **12**B is a segmented second bottom isometric view of a central portion of patient transport litter embodiment of FIG. **9** in a fully-folded state.

FIG. **13**A, FIG. **13**B, and FIG. **13**C are side views of the patient transport litter embodiment of FIG. **9** shown in an unfolded state, partially-folded state and fully-folded state, respectively.

FIG. **14**A is a first elevated isometric view of a receiver embodiment for selective lockable positioning of the patient transport litter embodiment of FIG. **9** on an emergency transport vehicle.

FIG. **14**B is a second elevated isometric view of the receiver embodiment of FIG. **14**A.

DETAILED DESCRIPTION

FIGS. **1-8** illustrate one embodiment of a patient handling system **1** comprising features of the present invention. Various alternative implementations of such features are within the scope of the invention.

The patient handling system **1** includes a portable patient transport litter **10** and an interconnection assembly **100** disposed within an emergency transport vehicle **200**. In the illustrated embodiment, emergency transport vehicle **200** may be a helicopter having a side access port **202** for accessing a cabin area **204**. The cabin area **204** is adapted to include an operator station **206** (e.g., a pilot cockpit seat) and at least one or a plurality of medical personnel transport stations **208***a*, **208***b*, **208***c* (e.g., flight seats). Further, cabin area **204** may comprise a predetermined area **210** within which patient transport litter **10** may be selectively positioned for connection with a floor-mount receiver **110** operable by hand-control members **150**, **152** of the interconnection assembly **100**. As illustrated, stations **208***a*, **208***b*, **208***c* may be disposed adjacent to the predetermined area **210** to provide medical personnel with patient access during emergency transport. In the illustrated embodiment, stations **208***a*, **208***b* are located on different sides of the predetermined area **210**.

FIG. **1** illustrates the patient transport litter **10** prior to loading on to emergency transport vehicle **200**. FIGS. **2-8** illustrate various positions of patient transport litter **10** upon emergency transport vehicle **200**. For purposes of explanation, FIGS. **1-8** are presented without the presence of system users. By way of example, in use of the system **1**, a patient may typically be retainably positioned on the patient transport litter **10** with patient harness straps **18**. Further, medical personnel may typically be located at a first end **12**, or on each side of the litter **10**, and at a second end **14** of patient transport litter **10** for loading at emergency transport vehicle **200**. Additionally, a vehicle operator may be located at operator station **206**, and one to three medical personnel would be located within the cabin **204** (e.g., at stations **208***a*, **208***b* and **208***c* after helicopter takeoff) to provide medical care to the patient during air transport.

In FIG. **1**, patient transport litter **10** is shown in an approach position relative to emergency transport vehicle **200**. In this regard, the patient support litter **10** may be located by medical personnel so that the first end **12** thereof (e.g., an end at which the patient's feet would typically be located) is oriented for advancement relative to an openable/closeable side access port **202** to cabin area **204** of the emergency transport vehicle **200**. For example, the patient support litter **10** may be positioned transverse to, e.g., substantially orthogonal to, a longitudinal axis of the emergency transport vehicle.

The patient transport litter **10** may include a patient support platform **20** supported by and pivotally connected to a frame **30**, wherein the frame **30** may be selectively pivoted by medical personnel between an unfolded, (e.g., raised) state, and a folded, (e.g., collapsed) state, relative to the patient support platform **20**, e.g., for loading on to emergency transport vehicle **200**. To facilitate rolling movement in an unfolded state, a first plurality of wheels **40** may be connected to frame **30**. Similarly, to facilitate rolling movement in a folded state, a second plurality of wheels **50** may be connected to frame **30**. In FIG. **1**, the frame **30** of patient transport litter **10** is in an unfolded state, wherein the patient transport litter **10** may be rolled on wheels **40** from a location at which a patient may be initially positioned and secured thereupon to a position adjacent to the emergency transport vehicle **200** for loading of the patient transport litter **10** thereupon by medical personnel located at each end of the patient transport litter **10**.

In that regard, and as shown in FIGS. **2** and **3**, the patient transport litter **10** may be positioned by medical personnel so that the first end **12** may be advanced into the side access port **202** (e.g., by elevating/advancing first end **12**). Correspondingly, a control member **4** of the patient transport litter **10** may be manipulated by medical personnel so that the frame **30** may be selectively pivoted relative to patient support platform **20** by medical personnel in a direction away from the first end **12** (e.g., in a clockwise direction), wherein the frame **30** is essentially folded from the raised, unfolded state to a collapsed, folded state. To facilitate such pivotal movement and maintain a desired center of mass and compactness, the frame **30** may be interconnected to the patient support platform **20** for longitudinal movement relative thereto (e.g., slidable or rollable movement along the patient support platform **20**). For example, upon pivotal movement of frame **30** relative to patient support platform **20**, the frame **30** may move (e.g., slide or roll) towards the second end **14** of the patient transport litter **10**.

A first end **12** of patient transport litter **10** may be provided with a leading plurality of wheels **60** connected thereto. Wheels **60** may be disposed for initial rolling engagement

with a floor **212** within the cabin area **204** of the emergency transport vehicle **200**. As may be appreciated, the provision of wheels **60** allows medical personnel to advantageously advance and position a portion of the patient transport litter **10** into the side access port **202**. Further, wheels **60** also facilitates medical personnel handling of the first end **12** of the patient transport litter **10** during unloading procedures.

In that regard, and as shown in FIG. **4**, the first end **12** of patient transport litter **10** may include a downward-oriented lateral member **70** adapted to engage at least one upstanding retention member **90** located at the side access port **202** of the emergency transport vehicle **200**. That is, when first end **12** of patient transport litter is rolled from a position within cabin area **204** to that illustrated in FIG. **4**, the lateral member **70** may "automatically" engage a retention member **90**. For such purposes, a u-shaped catch recess of retention member **90** may be located at a distance above the floor **212** that encompasses a distance at which lateral member **70** may be located when first end **12** is supported by wheels **60**.

The lateral member **70** may comprise an elongated shaft interconnected to and extending below and substantially parallel to a first end of the patient support platform **20** (e.g., extending along a width of the patient support platform **200**). Opposing ends of the lateral member **70** may be interconnected to the patient support platform **20** by brackets **72** that extend away from the first end **22** of the patient support platform **20** at locations below a top surface **24** of the patient support platform **20**. As noted, the retention member(s) **90** may comprise a u-shaped catch recess that faces inwardly (e.g., toward cabin area **204**) and is sized to receive the lateral member **70**. A plurality of retention members **90** may be spaced across the access port **202** to facilitate engagement across a range of relative positions.

In certain implementations, the access port **202** may also be provided with an optional ramp member **270** interconnected to the floor **212** by one or more hinges **272**. In one arrangement the hinged interconnection may be provided so that ramp member **270** may be pivoted from an upright transport position to a downward, outwardly-angled position for loading and unloading litter **10**.

As illustrated in FIG. **4**, wheels **60** of litter **10** may comprise multidirectional wheels that are each provided with a plurality of rollers **62** disposed about a circular periphery of a wheel hub **64**, wherein each of the wheels **60** is rotatable about a corresponding wheel rotation axis AA. Further, each of the rollers **62** may be provided for separate rotation about corresponding roll axes, wherein the roll axes of rollers **62** are disposed in a common plane or parallel planes. Such an arrangement allows for rolling advancement of the first end **12** of the patient transport litter **10** within cabin area **204** an omnidirectional manner via rotation of wheels **60** in a first direction and rotation of rollers **62** in a second direction transverse to the first direction. In turn, patient positioning to, within and from the predetermined area **210** is facilitated. In one implementation, multidirectional wheels **60** may comprise Rotacaster omni wheels marketed by Rotacaster Ltd. of Newcastle, Australia.

Further in this regard, reference is now made to FIG. **5** in which the first end **12** of patient transport litter **10** has been advanced into the emergency transport vehicle **200**. In conjunction with such advancement, two of the second plurality of wheels **50** interconnected to frame **30** have engaged and are rollable upon the floor **212** of the cabin area **204**. In conjunction with such engagement, patient transport litter **10** has been rolled in a clockwise direction. In this regard, the second plurality of wheels **50** may also be multi-directional, e.g., the same or similar to those described above in relation to the leading plurality of wheels **60**. As illustrated in FIG. **5**, the second plurality of wheels **50** may be disposed so that the patient transport litter **10** may be rolled any desired direction on the leading plurality of wheels **60** and the forward two of the second plurality of wheels **50**.

As shown in FIG. **5**, a first roll-restraint member **280** may be interconnected to floor **212** for engaging the patient transport litter **10** when located in a rearward, stowed position, as will be further described below in relation to FIG. **8**. First roll-restraint member **280** includes a forward-projecting pin for insertion into a corresponding aperture located at the first end **12** of the patient transport litter **10**. First roll-restraint member **280** restrains the first end **12** of litter **10** from lifting off the floor **212** and moving forwardly, e.g. in the event the nose of the emergency transport vehicle **200** moves downward relative to the back end thereof. Similarly, and as shown in FIGS. **1-3**, a second roll-restraint member **282** may be mounted to the floor **212** on one side of the predetermined area **210**. The second roll-restraint member **282** may comprise a laterally-projecting pin for insertion into an aperture on a side of the litter **10**. The second roll-restraint member **282** restrains the litter **10** from rolling, or tipping, sideways, e.g., in the event one side of the emergency transport vehicle **200** moves downward relative to the other side.

Reference is now made to FIG. **6**, which shows the patient transport litter **10** fully advanced into the emergency transport vehicle **200**, wherein a second end **14** thereof has entered the cabin area **204** with the patient transport litter **10** being further rotated in a clockwise direction. In conjunction with such advancement, the two trailing wheels of the second plurality of wheels **50** have engaged the floor **212** of the cabin area **204**. Correspondingly, the leading plurality of wheels **60** have disengaged the floor **212**. Again, the utilization of multi-directional wheels for the leading plurality of wheels **60** and the second plurality of wheels **50** facilitates the positioning of patient transport litter **10** within a relatively small amount of space.

As illustrated in FIG. **6**, the patient transport litter **10** has been positioned at the predetermined area **210**. In such position, the patient transport litter **10** is adapted for connection to the interconnection assembly **100**. In this regard, reference is now made to FIG. **7** which illustrates a perspective, cut-away view of the patient transport litter **10** and receiver **110** of interconnection assembly **100** mounted to the floor **212**. The patient transport litter **10** includes a longitudinal member **80** disposed below the patient support platform **20** and frame **30**. The longitudinal member **80** may comprise an elongated member extending along a length of the patient transport litter **10**. The longitudinal member **80** may be interconnected at opposing ends to the frame **30** by bracket members **84**.

As noted above, the interconnection assembly **100** may include a receiver **110** mounted to the floor **212** of the emergency transport vehicle **200**, and hand-control members **150**, **152** mounted to a rear wall within cabin area **204** of emergency transport vehicle **200**. The receiver **110** may include a laterally-accessible, u-shaped channel sized to receive the longitudinal member **80**, wherein the channel is at least partially defined by a channel member **112**. As shown, the receiver **110** may be positioned so that the channel is aligned parallel to a longitudinal axis of the predetermined area **210** within the emergency transport vehicle **200**. The receiver **110** may further include a closure member **116** that is pivotally disposed relative to the channel member **112**, wherein the closure member **116** is adapted to automatically pivot from an open-channel position to a closed-channel position upon receipt of the longitudinal member **80** within the u-shaped channel, as shown in FIG. **7**.

When longitudinal member **80** is positioned within the channel of receiver **110**, with rocker member **116** in a closed-channel position, side-to-side movement of patient transport litter **10** is restrained. The receiver **110** and longitudinal member **80** may be adapted to allow for slidable, longitudinal movement of the longitudinal member **80** and patient transport litter **10** relative to the receiver **110**. By way of example, the patient transport litter **10** may be advanced from the position shown in FIGS. **6** and **7** to a more rearward position within the predetermined area **210** of emergency transport vehicle **200**, as shown in FIG. **8**.

In this regard, and referring again to FIG. **7**, the longitudinal member **80** may be provided with a plurality of interconnection locations **82** disposed along at least a portion of the length thereof, and receiver **110** may be provided with a complimentary lock member (not shown in FIG. **6**) for locking interface with any one of the plurality of interconnection locations **82**. By way of example, the lock member of receiver **110** may comprise a spring-loaded pin member, and interconnection locations **82** may each comprise an aperture sized for receipt of the pin member thereinto. In this regard, the pin member may be biased by a spring member toward the longitudinal member **80** so as to automatically enter an aligned interconnection location **82**. In turn, when pin member is located within any one of the interconnection locations **82** the patient transport litter **10** may be restricted from both longitudinal and lateral movement relative to the receiver **110** of the interconnection assembly **100**, as well as the emergency transport vehicle **200**.

To allow for selective positioning of the longitudinal member **80** and patient transport litter **10**, relative to the receiver **110**, the interconnection assembly **100** may include a control member interconnected to the lock member of receiver **110**, e.g., wherein the control member is manipulable to retract a spring-loaded pin member of receiver **110** to allow for selective positioning and locking interface of longitudinal member **80** and patient support litter **10** relative to the receiver **110**. By way of example, the control member may comprise a first cable **120***a* having a first end interconnected to a spring-loaded pin member of receiver **110** and a second end interconnected to hand-control member **152** (e.g. shown in FIG. **1**), wherein the cable **120***a* is routed under the floor **212** therebetween. The hand-control member **152** may be manipulatable to selectively retract the pin member away from the longitudinal member **80** and interconnection locations **82** thereof to facilitate selective longitudinal positioning of the patient transport litter **10** to a desired retention location within the predetermined area **210**. A second control cable **120***b* may also be provided for selective lateral release of longitudinal member **80** from receiver **110**. More particularly, a first end of cable **120***b* may be interconnected to closure member **116** and a second end of cable **120***b* may be interconnected to hand-control member **150** (e.g., shown in FIG. **1**), wherein cable **120***b* is routed under the floor **212** therebetween. The hand-control member **150** may be selectively manipulatable so as to move closure member **116** to an open-channel position to allow longitudinal member **80** of patient transport litter **10** to be removed from receiver **80** (e.g., for unloading after emergency transport).

As may be appreciated, during transport of a patient in emergency transport vehicle **200**, the longitudinal position of patient support apparatus **10** within the predetermined area may be selectively modified via use of the control member. For example, the hand control member **152** may be manipulated to disengage a pin member of receiver **80** from longitudinal member **80** and the patient transport litter **10** may be selectively, rolled/advanced toward the front of an emergency transport vehicle **200** and locked in place so as to provide medical personnel with better access to the head of a patient positioned in patient transport litter **10**. The patient transport litter **10** may be returned to a stow position using a reversed procedure.

After transport of patient support litter **10** on emergency transport vehicle **200** to a desired location, patient transport litter **10** may be selectively disengaged from the receiver **110** and rolled/advanced to side access port **202** for unloading. In conjunction with such unloading, the frame **30** of patient transport litter **10** may be selectively unfolded to the upright state shown in FIG. **1**. Optionally the lateral member **70** may restrainably engage the retention member **90** to facilitate controlled handling. After unloading, patient transport litter **10** may be rolled to an acute care facility, or to another emergency transport vehicle for transport to an acute care facility.

In relation to the system embodiment described in relation to FIGS. **1-8**, it is noted that, apart from the patient transport litter **10**, various additional described componentry may be separately provided to adapt or retro-fit an emergency transport vehicle interior to operatively interface with the litter **10**. In particular, floor **212** may be defined by one or more panels securable to flooring of an emergency transport vehicle. In turn, receiver **110**, retention member(s) **90** and optional ramp **270** may be interconnected thereto, while control cables **120***a*, **120***b* may be routed thereunder. In turn, hand control members **150**, **152** may be mounted to an interior wall or other surface of the emergency transport vehicle.

Reference is now made to FIGS. **9-11** which illustrate another embodiment of a foldable patient transport litter **300**. The patient transport litter **300** includes a patient support platform **320** pivotally interconnected to a frame **330**. The frame **330** includes first frame portions **332***a*, **332***b* pivotally interconnected to the patient support platform **320** at first connections **333***a*, **333***b*, and a second frame portion **334** pivotally interconnected to the first frame portions **332***a*, **332***b* at second connections **335***a*, **335***b*.

A first plurality of wheels **340** may be interconnected in fixed relation to the second frame portion **334** to facilitate rolling movement of the patient transport litter **300** in an unfolded state. As illustrated, the first plurality of wheels **340** may comprise caster wheels with selectively lockable members **342** to restrain roller movement when desired.

To facilitate rolling movement of the patient transport litter **300** in a folded state, a second plurality of wheels **350***a*, **350***b* may be interconnected in fixed relation to first frame portions **332***a*, **332***b*. The second plurality of wheels **350***a*, **350***b* may be multi-directional to facilitate rollable movement in all directions. Wheels **350***a* may be interconnected to one end of truss members **354***a* that are interconnected in fixed relation to first frame portion **332***a* via brackets **352***a*. Another end of truss members **354***a* may be pivotally interconnected to patient support platform **320** via brackets **356***a* at the first end **322** of the patient support platform **320**. Wheels **350***b* may be interconnected in fixed relation to first frame portion **332***b* via brackets **352***b*. In turn, truss members **354***b* may be provided that are interconnected in pivotal relation to first frame portion **332***b*, e.g., at brackets **352***b*, and that are pivotally interconnected to patient support platform **320** via brackets **356***b* near the second end **323** of the patient support platform **320**.

To facilitate rolling engagement of patient transport litter **300** with a support surface of an emergency transport vehicle during intial steps of loading thereupon and final steps of unloading therefrom, the patient transport litter **300** may be provided with a leading plurality of wheels **360** interconnected to a first end **322** of the patient support platform **320**.

As shown, the leading plurality of wheels **360** may be multi-directional as described above.

A lateral member **370** may also be provided at the first end **322** of the patient support platform **320**. The lateral member **370** may be provided to engage a retention member(s) mounted to a floor of an emergency transport vehicle is a manner analogous to that described in relation to the lateral member **70** and retention member(s) **90** of the embodiment of FIGS. **1-8**. Further, a longitudinal member **380** may be interconnected to the second frame portion **334**. As shown, the longitudinal member **380** may extend along a length of the patient transport litter **300** (e.g., along a longitudinal center axis) and may be disposed below (e.g., project downward from) the second frame portion **334**. The longitudinal member **380** may comprise interconnection locations **382** (e.g., apertures) spaced along a portion thereof for selective linking interface with a receiver mounted to a floor of an emergency transport vehicle in a manner analogous to that described in relation to the longitudinal member **80**/interconnection locations **82** and receiver **110** of the embodiment of FIGS. **1-8**.

As shown in FIG. **9**, the patient support platform **320** may include sections **324***a* and **324***b* interconnected to an external frame **326**. Section **324***b* may be provided for selective and lockable, angular positioning relative to section **324***a*, so as to facilitate treatment of a patient in a partially upright position. In this regard, patient transport litter **300** is generally sized for positioning of a patient's upper body portion on section **324***b* and lower body portion on section **324***a*, wherein a patient's feet may be located near the first end **322** of patient support platform **320** and a patient's head may be located near a second end **323** of patient support platform. Each of the sections **324***a* and **324***b* may be padded for patient comfort. Further, section **324***b* may include a headrest **325**. As shown, the patient support platform **320** may also include selectively connectable straps **328** to secure a patient to a top surface **321** of the patient support platform **320**.

Referring now specifically to FIGS. **10** and **11**, the patient transport litter **300** may include control members **400***a* and **400***b* (e.g., lateral handles) interconnected to the patient support platform **320** at the second end **323** thereof. The control member **400***a* may be operated by medical personnel to selectively unlock and position the patient transport litter **300** from an unfolded state, as shown in FIGS. **10** and **11**, to a folded position as further described hereinbelow. In certain embodiments, control member **400***a* may also be utilized to selectively position and lock the patient transport litter **300** in one or more intermediate, or partially-folded, positions as will be described hereinbelow. The control member **400***b* may be operated to selectively release the patient transport litter **300** from a fully-folded, locked state to an unfolded state or partially-folded state.

In the illustrated arrangement, the control member **400***a* may be advanced, or squeezed, relative to the frame **326** at the second end **323** of the patient transport litter **300** (e.g., while anchoring the frame **326** at second end **323**) to realize relative movement therebetween, wherein the patient transport litter **300** may be folded from an unfolded state to a fully-folded or partially-folded state. To unfold the patient transport litter **300** from a fully-folded state, control member **400***b* may be advanced, or squeezed, relative to the frame **326** at the second end of the patient transport litter **300** (e.g., while anchoring the frame **326** at second end **323**).

The control member **400***a* may be interconnected via linkage members **402** to moveable members **404***a*, **404***b* (e.g., slide and/or roller members) interconnected to and longitudinally moveable in relation to rail members **406** (e.g., channel and/or cam members) that are fixedly interconnected to a bottom side of the patient support platform **320**. The moveable members **404***b* may be provided to be lockable in set positions relative to the rail members **406** when the patient transport litter **300** is in an unfolded state, as shown in FIG. **11**, and optionally at one or more partially-folded position(s) (e.g., via a spring-loaded pin and multiple-slot arrangement in which squeezing control member **400***a* causes the spring-loaded pin to exit a given slot to unlock the moveable members **404***b*).

Reference is now made to, FIGS. **12**A and **12**B which illustrate segmented, bottom views of a central portion of the patient transport litter **300** in an unfolded state and folded state, respectively. As illustrated, first frame portion **332***b* may be pivotally interconnected to patient support platform **320** at interconnections **333***b* that are provided by moveable members **404***b*. Additionally, first frame portion **332***a* may be pivotally interconnected to patient support platform **320** at interconnections **333***a* that are provided by moveable members **404***a*.

As further shown by FIGS. **12**A and **12**B, the provision of first frame portions **332***a*, **332***b* that may be pivotally interconnected to patient support platform **320** at locations that may be longitudinally moved (e.g., lengthwise) along the patient support platform **320** facilitates folding and unfolding while also yielding compactness and controllable mass movement.

Latch members **310** may be interconnected to a bottom side of the patient support platform **320** (e.g., near bracket member(s) **356***b*). The latch members **310** may be pivotably interconnected to the patient support platform **320** and biased by corresponding springs **420** to assume the latch positions illustrated in FIGS. **12**A and **12**B. The latch members **310** may be provided to lock the patient support platform **320** in a fully-folded state by restrainably engaging the second frame portion **334** when the patient transport litter **300** is in a folded state, as shown in FIG. **12**B. The latch member(s) **310** may also be interconnected to the control member **400***b*, wherein upon squeezing the control member **400***b*, the latch member(s) **310** may be pivoted so as to disengage, or unlock, from second frame portion **334** to allow patient transport litter **300** to be unfolded.

As further illustrated by FIG. **12**B, wheels **350***b* may comprise multi-directional, wheels that are each provided with a plurality of rollers **351** disposed about a circular periphery of a wheel hub **353**, wherein each of the wheels is rotatable about a corresponding wheel rotation axis AA. Further, each of the rollers **351** may be provided for separate rotation about corresponding roll axes, wherein the roll axes of rollers **351** are disposed in a common plane and/or parallel planes. Such an arrangement allows for rolling advancement of the patient transport litter **300** in a first direction via rotation of wheels **350***a*, **350***b* and in a second direction, transverse to the first direction, via rotation of rollers **351** of the wheels. In this regard, the litter **300** may be advantageously rolled in any selected direction. In turn, patient positioning to, within and from an emergency transport vehicle is facilitated.

Reference is now made to FIGS. **13**A, **13**B and **13**C, which illustrate patient transport litter **300** in an unfolded state, a partially-folded state and a folded state, respectively. As shown in FIG. **13**A patient transport litter **300** is in an unfolded state, wherein it is rollable on the first plurality of wheels **340**. As previously noted, the patient transport litter **300** may be maintained in the unfolded state, and optionally in a partially-folded state, via a locking interface between moveable members **404***b* and rail members **406**. In the unfolded state, the patient support platform **320** and first frame portions **332***a*, **332***b* may be provided so as to be

non-orthogonal at the interconnection locations **333***a*, **333***b*, and the first frame portions **332***a*, **332***b* and second frame portion **334** may be correspondingly provided to non-orthogonal at the interconnection locations **335***a*, **335***b*. For example, in the illustrated embodiment, first frame portion **332***a*, **332***b* are at an acute angle relative to the portions of the patient support platform **320** that extend towards the second end **323** thereof from interconnection locations **333***a*, **333***b*. As may be appreciated, such non-orthogonal positioning facilitates compactness when the patient transport litter **300** is positioned in a folded state or partially-folded state.

In that regard, and as noted, to fold the patient transport litter **300** first medical personnel may manipulate control member **400** relative to the frame **326** at second end **323** so as to selectively release the moveable members **404***b* from locked engagement with rail members **406**. In conjunction with such operation, first medical personnel located at first end **322** and second medical personnel located at the second end **323** may supportably lower the patient transport platform **320** in a controlled manner.

As illustrated by a comparison of FIG. **13**A and FIG. **13**B, moveable members **404***a*, **404***b* move (e.g. slide in rails **406**) towards the first end **322** of the patient support platform **320** as patient transport litter is folded from a non-folded state. Concomitantly, first frame portions **332***a*, **332***b* have pivoted relative to patient support platform **320**, and moveable members **404***a*, **404***b*. In short, moveable members **404***a*, **404***b* advantageously provide longitudinally moveable pivot locations **333***a*, **333***b* for folding and unfolding purposes. As further reflected by the comparison of FIG. **13**A and FIG. **13**B, during folding of the patient transport litter **300** from the unfolded position shown in FIG. **13**A to the partially-folded position shown in FIG. **13**B, the moveable members **404***b* disposed adjacent to second end **323** have moved a lesser distance relative to patient transport platform **320** than the moveable members **404***a* disposed adjacent to first end **322** of the patient transport platform **320**. In the partially-folded position shown in FIG. **13**B, moveable members **404***a*, **404***b* may be restrained from further movement along rail members **406**.

Reference is now made to FIG. **13**C which illustrates patient transport litter **300** further folded from the partially-folded position shown in FIG. **13**B to a fully-folded position. In conjunction with such further folding movement, the first frame portions **332***a*, **332***b* have further pivoted in a direction corresponding with the first end **322** of the patient transport platform **320**, wherein a compact folded arrangement is realized as shown in FIG. **13**C. As further illustrated in FIG. **13**C, when in the fully-folded position, the second plurality of wheels **350***a*, **350***b* are disposed at a greater distance below patient transport platform **320** than the first plurality of wheels **340**, thereby lifting the first plurality of wheels **340** off a support surface to facilitate rolling movement of patient transport litter **300** on the second plurality of wheels **350***a*, **350***b* in the fully-folded position. Further in this regard, when in the fully-folded position shown in FIG. **13**C the latch members **310** retainably engage the second frame portion **354**.

Reference is now made to FIGS. **14**A and **14**B which illustrate a receiver **410** mountable to the floor **512** of an emergency transport vehicle for selective lockable, interconnection with the patient transport litter **300**. The receiver **410** may include a laterally-accessible, u-shaped channel **430** sized to receive the longitudinal member **380** of the patient transport litter **300**. As illustrated, the channel **430** may be defined by u-shaped blocks **412** oriented laterally and mounted to a support **414**. The receiver **410** may further include a closure member **416** that is located between and pivotally disposed relative to the u-shaped blocks **412**. The closure member **416** may be interconnected to a control cable **420***b* that may be interconnected to a hand control member that may be selectively manipulatable to pivot the rocker member **416** from the closed position shown in FIG. **14**A to an open position for receipt and/or release of the longitudinal member **380** relative to channel **430**. In some arrangements, the closure member **416** may automatically pivot to the closed position shown in FIG. **14**A when the longitudinal member **380** is presented to channel **430**.

As may be appreciated, when the longitudinal member **380** is located within the channel **430** of receiver **400**, with closure member **416** in the closed position, lateral movement of patient transport litter **300** is restrained. In this regard, the receiver **410** and longitudinal member **380** may be adapted to allow slidable, longitudinal movement of the longitudinal member **380** and patient transport litter **300** relative to the receiver **410**. Further, the receiver **410** and longitudinal member **380** may be operable to selectively lock the longitudinal member **380** and patient transport litter **300** in a desired longitudinal position relative to the receiver **410** (e.g., along an axis corresponding with a center axis of channel **430**).

In one approach, the longitudinal member **380** may be provided with the plurality of interconnection locations **382** defined by apertures as illustrated in FIG. **9** hereinabove. Such apertures may be sized to receive a spring loaded pin member **440** comprising receiver **410** (shown in phantom lines in FIG. **14**A). In this regard, the pin member **440** may be biased by a spring member toward the longitudinal member **380** when positioned in channel **430**, so as to automatically project in to an aligned interconnection aperture **382**. In turn, when pin member **440** is located within any given one of the interconnection apertures **382** the patient transport litter **300** may be restricted from both longitudinal and lateral movement relative to the receiver **410**.

To allow for selective positioning of the longitudinal member **380** and patient transport litter **300**, relative to receiver **410**, the pin member **440** may be interconnected to a control cable **420**A that may be interconnected to a hand-control member that is selectively manipulatable to retract the pin member **440** away from longitudinal member **380**. In this regard, such hand-control member may be utilized to selectively position and lock the longitudinal member **380** and patient transport litter **300** in any one of a plurality of longitudinal locations relative to receiver **410** utilizing a selective one of the plurality of interconnection locations defined by apertures **382**.

As may be appreciated, the patient transport litter **300** and receiver **410** described in relation to FIGS. **9-14**A & **14**B may be utilized in conjunction with the system features described in relation to the embodiment of FIGS. **1-8**.

The foregoing description of the present invention has been presented for purposes of illustration and description. Furthermore, the description is not intended to limit the invention to the form disclosed herein. Consequently, variations and modifications commensurate with the above teachings, and skill and knowledge of the relevant art, are within the scope of the present invention. The embodiments described hereinabove are further intended to explain known modes of practicing the invention and to enable others skilled in the art to utilize the invention in such or other embodiments and with various modifications required by the particular application(s) or use(s) of the present invention. It is intended that the appended claims be construed to include alternative embodiments to the extent permitted by the prior art.

What is claimed is:

1. A portable patient transport litter, comprising:

a patient support platform for supporting a patient thereupon;

a frame interconnected to said patient support platform and selectively foldable between an unfolded state and a folded state;

a first plurality of wheels interconnected to said frame and supporting said frame and said patient support platform with said frame in said unfolded state; and

a second plurality of wheels interconnected to said frame for supporting, independently of said first plurality of wheels, said frame and patient support platform with said frame in said folded state, each of said second plurality of wheels being multi-directional, wherein for a given common orientation of said second plurality of wheels said portable patient transport litter is rollable in at least two different directions with said frame in said folded state.

2. A portable patient transport litter as recited in claim **1**, wherein each of said second plurality of wheels comprises:

at least a first plurality of roll members interconnected and disposed about a circle for rotation together about a wheel rotational axis, and wherein each of said roll members is separately rollable about a corresponding roll axis that is transverse to said wheel rotational axis.

3. A portable patient transport litter as recited in claim **1**, further comprising:

a third plurality of wheels interconnected to and extending away from an end portion of said patient support platform, wherein said third plurality of wheels does not include said first or second plurality of wheels.

4. A portable patient transport litter as recited in claim **3**, wherein each of said third plurality of wheels is multi-directional, wherein for a given common orientation of said third plurality of wheels said patient support platform is rollable in at least two different directions.

5. A portable patient transport litter as recited in claim **4**, wherein each of said third plurality of wheels comprises:

at least a first plurality of roll members interconnected for rotation together about a wheel rotational axis, and wherein each of said roll members is separately rollable about a corresponding roll axis that is transverse to said wheel rotational axis.

6. A portable patient transport litter as recited in claim **1**, wherein said frame comprises:

a first frame portion pivotally interconnected to said patient support platform; and

a second frame portion, wherein said first frame portion is pivotally interconnected to said second frame portion, and wherein said patient support platform is selectively pivotable between a first position with said frame in said unfolded state and a second position with said frame in said folded state, said first position being elevated relative to said second position.

7. A portable patient transport litter as recited in claim **6**, wherein said patient support platform is maintainable in a predetermined orientation relative to said second frame portion with said frame in said unfolded state and said folded state, and throughout pivotal movement of said patient support platform between said first and second positions.

8. A portable patient transport litter as recited in claim **6**, wherein said first frame portion is slidable relative to said patient support platform, wherein said patient support platform is slidable from a first location relative to said first frame portion to a second location relative to said first frame portion in conjunction with pivotal movement of said patient support platform between said first position and said second position.

9. A portable patient transport litter as recited in claim **6**, further comprising:

a third plurality of wheels interconnected to and extending away from an end portion of said patient support platform.

10. A portable patient transport litter as recited in claim **6**, wherein said second frame portion comprises:

a plurality of connection locations disposed along a length of the portable patient transport apparatus for connection of a selected one of the plurality of connector locations with a complimentary connection member mounted to an emergency transport vehicle.

11. A method for emergency transport of a patient, comprising:

positioning a patient on a patient support platform of a portable patient transport litter;

moving the portable patient transport litter with the patient to an emergency transport vehicle, said moving step comprising rolling the portable patient transport litter with the patient on a first plurality of wheels of the portable patient transport litter;

loading the portable patient transport litter with the patient into said emergency transport vehicle through a side access port located on a side of the emergency transport vehicle, said loading step comprising folding a frame comprising the portable transport litter from an unfolded state to a folded state; and

rolling, independently of the first plurality of wheels, the portable patient transport litter with the patient on a second plurality of wheels of the portable patient transport litter to a desired location within the emergency transport vehicle, wherein for a given common orientation of the second plurality of wheels the portable patient transport litter is rollable in at least two different directions.

12. A method as recited in claim **11**, wherein said rolling comprises:

rotating each of said second plurality of wheels about corresponding wheel rotation axes in a first direction, wherein each of said second plurality of wheels comprises at least one plurality of roll members interconnected and disposed about a circle; and

rolling at least one of said at least one plurality of roll members of each of said second plurality of wheels in a second direction.

13. A method as recited in claim **11**, wherein said frame comprises a first frame portion and a second frame portion, and wherein said folding step comprises:

pivoting said patient support platform with the patient relative to said first frame portion, and said first frame portion relative to said second frame portion.

14. A method as recited in claim **13**, wherein said folding step further comprises:

moving said patient support platform with the patient relative to said first frame portion.

15. A method as recited in claim **11**, further comprising:

retaining a first end of the patient support platform at a location proximate to said side access port of said emergency transport vehicle.

16. A method as recited in claim **11**, wherein said loading step further comprises:

rolling a first end portion of the patient support platform with the patient on another plurality of wheels comprising the portable patient transport apparatus.

17. A method as recited in claim 11, further comprising:

positioning a first connection member of said portable patient transport litter within a connector affixed to the emergency transport vehicle at the desired location, wherein the portable patient transport litter is restrained from movement in at least one direction.

18. A method as recited in claim 17, further comprising:

adjusting the position of the portable patient transport litter relative to and with the first connection member located within the connector; and

releasably locking the portable patient transport litter into a selected one of a plurality of transport positions relative to the connector.

19. A method as recited in claim 17, further comprising:

locating the portable patient transport litter on another emergency transport vehicle.

20. A method as recited in claim 19, further comprising:

positioning a second connection member of said portable patient transport litter within another connector affixed to the another emergency transport vehicle, wherein the portable patient transport litter is restrained from movement in at least one direction.

21. A method as recited in claim 20, further comprising:

adjusting the position of the portable patient transport litter relative to and with the second connection member located within the another connector; and

releasably locking the portable patient transport litter into a selected one of a plurality of transport positions relative to the another connector.

22. A method as recited in claim 11, wherein said moving step comprises rolling the portable patient transport litter over a support surface on the first plurality of wheels, and wherein the method further comprises during said folding step:

lifting the first plurality of wheels away from the support surface; and

contacting the second plurality of wheels with the support surface.

23. A portable patient transport litter as recited in claim 6, wherein a center of mass of said patient support platform and a center of mass of said frame are laterally movable relative to each other relative to a support surface to maintain a desired center of mass of said portable patient transport litter over said support surface in conjunction with pivotal movement of said patient support platform between said first position and said second position.

24. A portable patient transport litter as recited in claim 1, wherein said first plurality of wheels is disposed at a different distance from said patient support platform than is said second plurality of wheels when said frame is in each of said unfolded and folded states.

25. A portable patient transport litter as recited in claim 24, wherein said first plurality of wheels is spaced farther from said patient support surface than is said second set of wheels in said unfolded state.

26. A portable patient transport litter as recited in claim 24, wherein said second plurality of wheels is spaced farther from said patient support surface than is said first set of wheels in said unfolded state.

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